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Wireless
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Eddystone Receivers

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PW Looks Into The World Of The Receiver And Receiving Techniques

Constructional

A VLF Up-Converter, Valved Active Antenna, CW Filter

Reviewed

The Alinco DJ-180EB 144MHz Hand-Held Transceiver

Antenna Workshop

Peter Dodd Reviews The Barker & Williamson BWD1.8-30 Antenna

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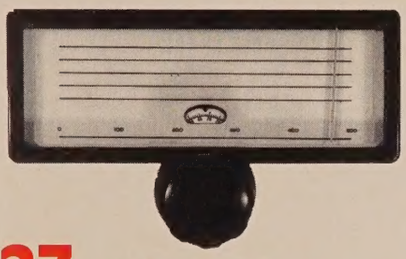

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COMING NEXT MONTH

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32-Page Pull-Out Greenweld Spring Catalogue

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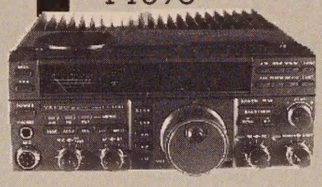

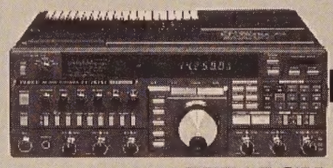

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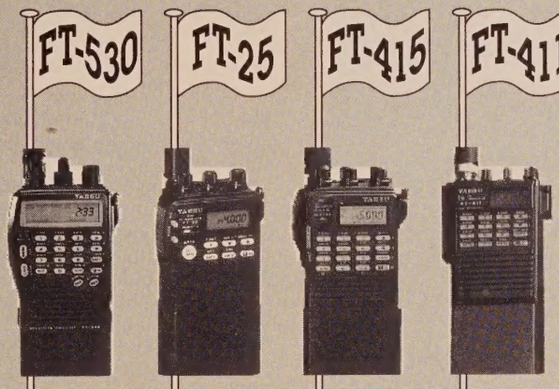

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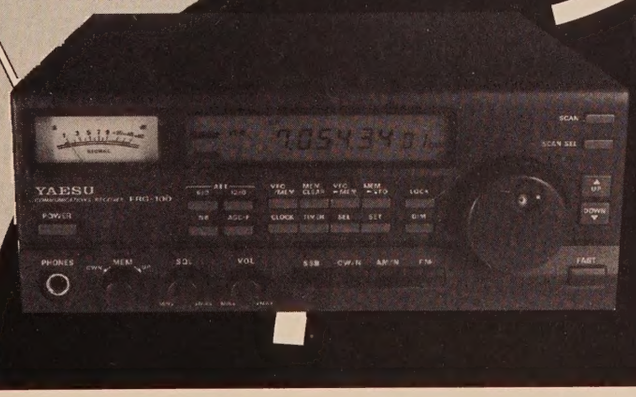

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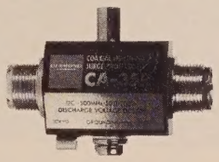

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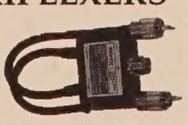

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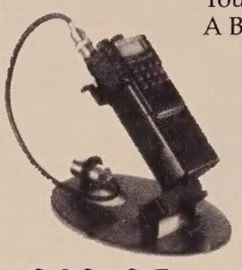

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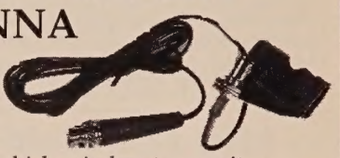

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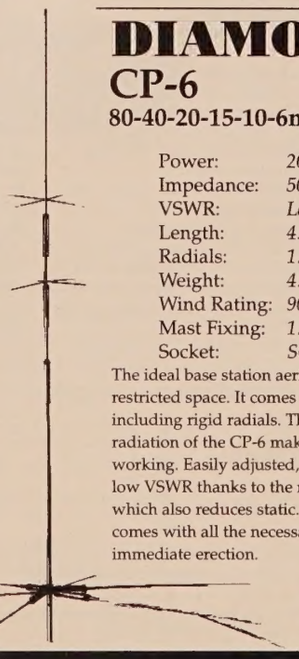
Add £1 Postage any aerial

DIAMOND CP-6

80-40-20-15-10-6m



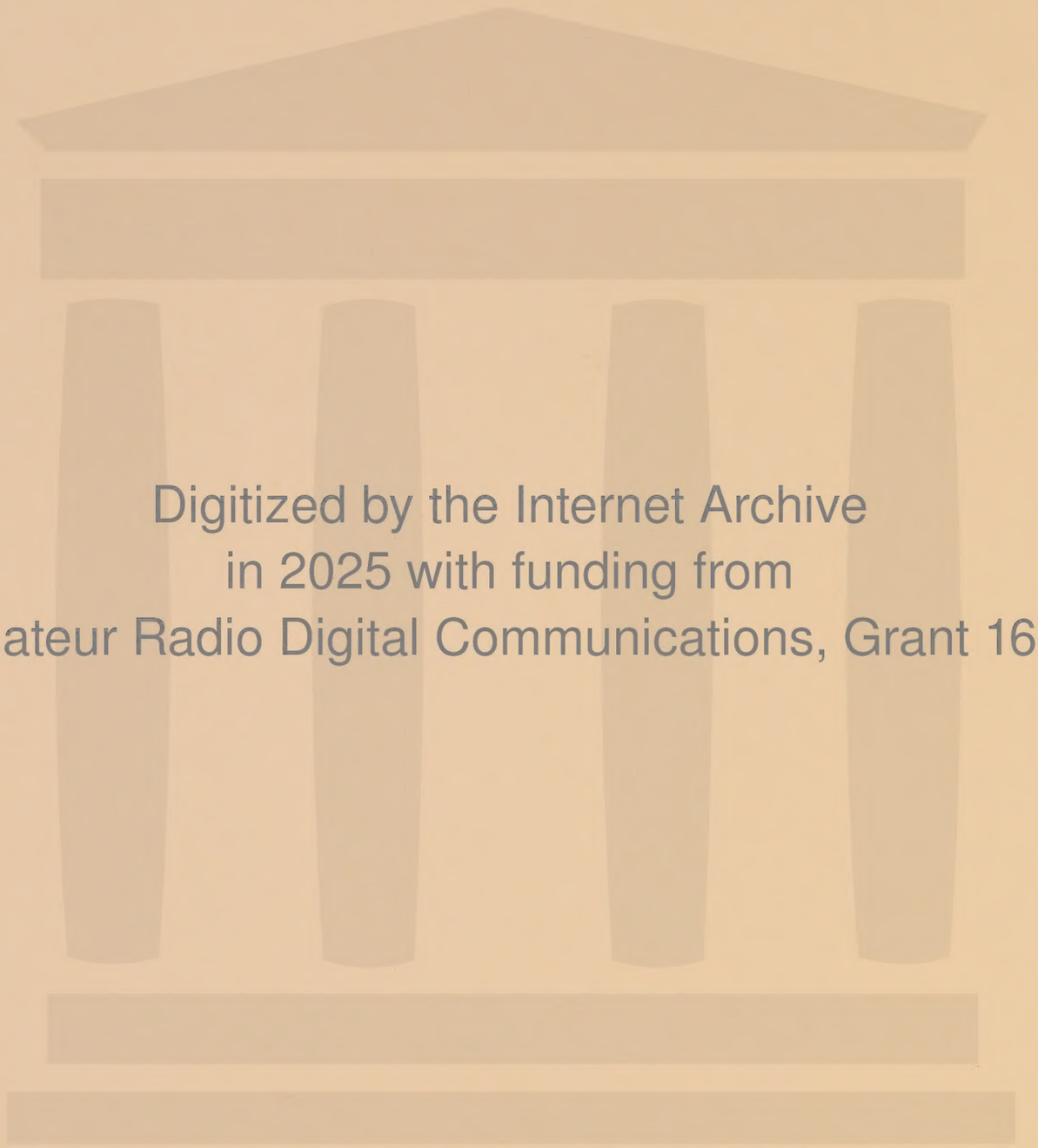
Power:	*200W*
Impedance:	*50 Ohms*
VSWR:	*Less than 1.5:1*
Length:	*4.6m*
Radials:	*1.8m approx.*
Weight:	*4.9kg*
Wind Rating:	*90mph*
Mast Fixing:	*1.5"-2.25"*
Socket:	*SO-239*

The ideal base station aerial for all those with restricted space. It comes absolutely complete including rigid radials. The low angle radiation of the CP-6 makes it superb for DX working. Easily adjusted, it provides very low VSWR thanks to the matching section which also reduces static. Ruggedly built, it comes with all the necessary clamps for immediate erection.

£249.95
Carriage £8.00

WATERS & STANTON

TO ORDER SEE INFORMATION ON NEXT 2 PAGES



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UK's LARGEST SELECTION OF HAM RADIO PRODUCTS

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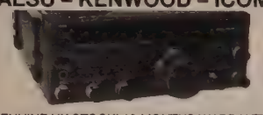
All Popular HF Rigs from Stock
YAESU – KENWOOD – ICOM



GENUINE UK STOCK! 12 MONTHS WARRANTY

Used 3 Month Warranty

Ten-Tec Omni V	£1395
Yaesu FT-1-1ZD	£399
Yaesu FT-747GX2	£499
Yaesu FT-980	£899
Yaesu FTV-107R	£159
Tokyo HX-240	£189
Daiwa CNW-518 atu	£149
Alinco DJ-160EA 2m	£179
Kenwood TH-215 2m	£169
Kenwood TH-405 70cms	£189
Kenwood TH205E 2m	£159
Icom IC-2E	£139
Alinco DJ-460E	£179
Kenwood TR-2500	£149
Alinco ALD-24E 2m/70cm	£299
Alinco ALR-72E 2m mobile	£169
Yaesu FT-290R all mode	£299
Kenwood R-1000	£249
Yaesu FRG-8800	£449
Kenwood R-600	£219
Sony Air-7	£149
Datong PC-1 Rx hf - 2m	£49
Telereader RTTY/CW	£129
Codemaster RTTY/CW	£99
Sony Pro-80 Rx	£199
Fairmate HP-82 Scanner	£119

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VHF/UHF
All with "N" connectors
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20809 9 el	£42.95
20089 9 el	£45.95
20822 11 el	£99.95
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70cm	
20909 9 el	£39.95
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23cm	
20623 23 el	£42.95
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Fastest Mail Order. We Promise!

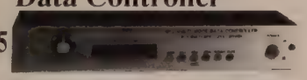
Our mail order operation is the fastest and best-stocked in the UK. Virtually everything in this magazine is available from us and the chances are that we can get it to you within twenty four hours of receiving your order. We operate a completely computerised system with two terminals and even have three staff solely packing goods. We also take care of you and your order. Everything we despatch is carefully checked, packed and insured against loss or damage. No risk to you whatsoever. And if the goods are not satisfactory immediately upon arrival we will offer a full refund or an alternative item.

Peter Waters G30JV/G0PEP

MFJ 20m QRP CW RIG £199

The long awaited MFJ QRP rig has arrived. 5 Watts of CW with an excellent receiver including a 500Hz xtal filter. You also get semi break-in, rit in and a very smooth vfo from 14.00-14.075 MHz. Power requirements are 13.8V DC.

MFJ 1278 Multi mode Data Controller
£299.95



The MFJ-1278 is the most comprehensive data controller ever offered by us. It has more modes than any other model and is now outselling all other competitive units. You get 9 modes: **Packet (including mail box) FAX, AMTOR, SSTV, RTTY, NAVTEX, ASCII, Electronic keyer, CW reader,** plus a feature packed specification. Now is the ideal time to try all these interesting modes from one single box. Watch the data and pictures come up on the screen; converse with fellow hams around the world and get the most out of your vhf or hf station. Amazing value, and even more amazing performance. We can also supply matching software package, software manual and cables for IBM 232 port at an inclusive price of **£299.95.**

Ten-Tec Omni-VI 160-10m 0-100W £2,495

The OMNI VI is different from any other hf transceiver you have used or ever seen. Craftsman built, it employs beautifully assembled circuit boards that are easily accessible should you ever need to service them. The factory actually encourage you to take the covers off and examine the craftmanship. No mass production here!

Receiver experts agree that good old crystal mixing can't be beaten and using this method the phase noise has essentially been eliminated. The OMNI-VI can receive signals on todays crowded bands that other popular models can't even hear. Great for contests and DX! A truly quiet receiver.

The OMNI-VI is an engineers dream. Superb IF crystal filters, an automatic notch filter that can handle any number of heterodynes, pass band tuning, 10kHz IRT and DSP 5 step audio filter. A 20MHz microprocessor takes care of all the programming with data entry being carried out from the front panel. The OMNI-VI has the fastest QSK in the business that gives effortless break-in operation on CW. You also get an iambic keyer, 100 memories, a scratch pad and a true 0-100 Watt power control. Now you can run true QRP, even milliwatts with this rig.

We have a colour brochure on this fine transceiver. The price is correct at the time of going to press but may be subject to alterations owing to exchange rate fluctuations.

AZDEN
Direct Factory Prices!
£239.95!
PCS-7000

- 2m FM 25 W
- AM Airband Rx
- FM 138-174MHz
- 20 Memories
- Auto Tone-burst
- Scanning
- Programme Shift
- Mic & Hardware

The AZDEN PCS-7000 is possibly the most underated rig available. It is simple to operate and can store tone-burst information in its memory. In order to promote it we are, for a limited period, offering you the chance to purchase at "factory prices." There's no catch; these are genuine current production models complete with all accessories plus our money back warranty if goods returned within ten days. How's that for an offer!

DIAMOND

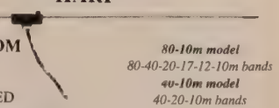
BASE STATION ANTENNAS

CP-5	10-15-20-40-80m vertical with radials £229.95
CP-6	6-10-15-20-40-80m vertical with radials £249.95
D-130N	Discone 25-1300 MHz. 50 FT cable £94.95
CP-22E	2m 2 × 5/8 6.5dB gain omni directional £49.95
D-707	Active rx. 1.5-1300 MHz 12V £109.95

FIBREGLASS VERTICALS

X-50	2m/70cms 4.5/7.2dB gain 1.7m long £69.95
X-300	2m/70cms 6.5/9dB gain 3.1m long £109.95
X-510	2m/70cms 8.3/11.7dB gain 5.2m long £159.95
X-700	2m/70cms 9.3/13dB gain 7.2m long £295.95
V-2000	6m/2m/70cms 2.15dBi/6.2dB/8.4dB 2.5m £109.95
X-5000	2m/70cms/23cms 4.5/8.3/1.7dB 1.8m £129.95

"HARI"



HARI WINDOM
NO TRAPS
NO ATU
COAXIAL FEED

80-10m model
80-40-20-17-12-10m bands
40-10m model
40-20-10m bands

1 KW or 200 W versions

40-Wind-LP 40/20/10m 200W 21m	£49.95
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80-Wind-LP 80/40/20/17/12/10m 42m	£55.95
80-Wind-HP 80/40/20/17/12/10m 42m	£69.95

MFJ Products from Stock!
300W HF ATU

The MFJ-948 is a complete 300 Watt aerial matcher in one box. It will match coaxial, balanced feeder and single wires. A dual needle VSWR/Power meter makes adjustment simple and a 3 way aerial switch completes the package. Fantastic value! **£142.95**

Other MFJ Products:

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MFJ-901B	ATU less switch load and meter. Super!	69.95
MFJ-264	1.5kW dummy load. DC-650MHz	69.95
MFJ-260B	300W dummy load DC-160MHz	35.95
MFJ-816	HF 30/300 Watt power meter	31.95
MFJ-812B	144MHz 30/300 Watt power meter	31.95
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Full Size 80-10m 102ft £21.95
Half Size 40-10m £19.50

COMPACT OPTION
Using our EL-40XC coils you can operate the half size version on 80 metres without affecting its performance on the other bands. The length is increased by only a few feet but as this added length of wire may be dropped vertically at the end, the overall length remains the same. 80-10m in 66ft of space! **Coils £18.95 per pair.**

New Delta II tranceiver now available
100 Watt Output plus variable filter **£1995**

AMERITRON HF LINEARS
NEW
600 Watts
£799!
AL-811

This linear is incredible value. We have put it throuh its paces and it really stands abuse. 3 rugged 811A tubes provide up to 600 Watts output from 160-10m. A hunky mains transformer and full metering is included. Used by DX-peditions it has to be amazing value at **£799 inc VAT**

AL-80BX 1kW from 160-10m 3-500z tube. ***£1499.00.***

Other Ameritron linears are available. Send SAE today.

Super Sensitive Frequency Counter
10Hz-3GHz! *£199*

We've purchased a quantity of the **OptoElectronics 2810** frequency sniffers at well below the normal factory price and are passing the savings on to you! Used for checking out the frequency of remote transmitters, this unit will amaze you. It's got a beautiful clear LCD display, ni-cad battery, mains charger and telescopic aerial. There's variable gate times, BNC inputs of 50 Ohms and 1 Meg and a hold button to store a frequency. It will sniff the average handheld at a distance of 100ft and base stations over much greater distances. Ideal for workshop, scanning enthusiasts and those who think they are being bugged! Full 12 months warranty.

NEW Maplin Electronics
SENDER – 145
£169.95!
FACTORY PRICES
2 Metres
5 Watts
Rx 130-169Mhz
Full Warranty

70 Cms Model
SENDER-430
£179.95

This new exciting handheld from Maplin Electronics is offered to you at a direct factory price. And with the current exchange rate you will agree that this is amazing value. You get a proper English handbook, two battery packs (4 and 6 x AA cells) helical aerial and carry strap.

Direct keypad entry, 20 memory channels, 1750Hz tone, 5 Watts on 12 Volts and comprehensive scanning all go to make this a unique radio at a unique price. And you'll love its small size (84 x 55 x 31mm) and rugged construction. Other features include: Battery Save, Dual off, Rotary Dial, 6 channel steps, Split frequency, 3 power levels, Dial Light etc.

DISCOUNT PRICE!

ALINCO ELECTRONICS GmbH.
DJ-180E 2m Handheld

£189.95 *Free Ni-Cads Free Charger Free Delivery*

- ★ LCD Display
- ★ 10 Memories
- ★ Repeater Shift
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- ★ Ni-Cad Pack
- ★ AC Charger
- ★ Auto Power Off
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- ★ 5kHz-25kHz steps
- ★ Superb Audio
- ★ Helical Aerial
- ★ 132 x 58 x 33mm

At this price the ALINCO DJ-180E represents your last chance to purchase a top brand name handheld at yesterday's prices. The DJ-180E offers more features per Pound than any other rig. Take advantage of this offer and pocket the difference. You'll get a superbly engineered radio with a quality name and our 12 month warranty. There are plenty of accessories to follow including a memory expansion module to give you 50 or 200 channels. Offer subject to current stocks only.

NEW! ALINCO ELECTRONICS GmbH. DJ-F1E 2m FM

Special Offer £259

The DJ-F1E is outselling any other 2 metre handheld we stock. Its performance, reliability and construction are unsurpassed. So convinced are we that the DJ-F1E offers the greatest value ever, we are happy to offer you a full refund if you are not immediately happy with its performance or features. That's right, return the transceiver to us within 10 days of purchase and we'll offer you a refund or an alternative, the choice is yours! That's confidence. **Peter G30JV**

- ★ Tx: 144-146MHz
- ★ Rx: 108-174MHz
- ★ 5 Watts output (12V DC)
- ★ 40 Memories
- ★ 3 way Power Setting
- ★ Illuminated Key Pad
- ★ 6 Programmable steps
- ★ Programmable Shift
- ★ 1750Hz tone
- ★ Frequency Lock
- ★ PTT Lock
- ★ Beep on/off
- ★ Automatic Lamp
- ★ DTMF Tones
- ★ Reverse Repeater
- ★ 8 Scan modes
- ★ Battery Saver
- ★ S meter
- ★ Priority Channel
- ★ Fast tune function
- ★ Rotary Dial
- ★ Illuminated LCD
- ★ Quick touch Squelch
- ★ Protected Output
- ★ BNC socket
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- ★ Many Accessories

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Important Notice: some prices may be subject to alteration owing to exchange rate variations. Please check when ordering.

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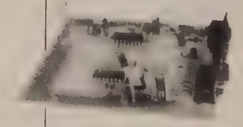

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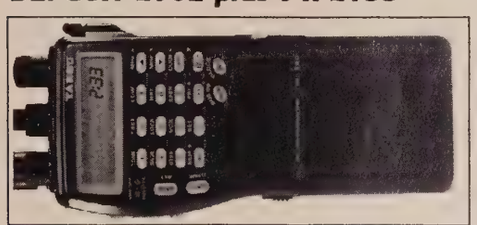
Interest Free - ZERO % APR !!

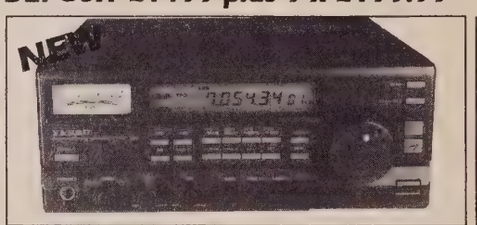
FT 990 100W H.F. multimode Gen. cov. rx plus ATU. DC version also available.
DEPOSIT £902 plus 9 x £133

FT 1000 Is it the world's no.1 TCVR. Should be. 200w multimode. Rx-100k -30MHz
DEPOSIT £1499 plus 9 x £199.99

FT 890 Selling like hot cakes. The HF minute, mobile, multimode, multibander.
DEPOSIT £299 plus 9 x £100

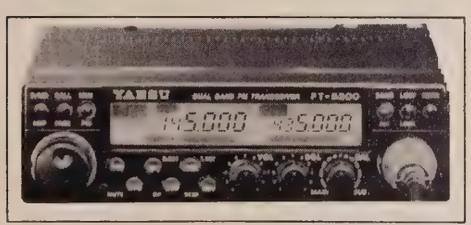


FT 530 Latest all band handy. 5w 2m and 70cms. Dual rx on 1 band. Spectacular!
DEPOSIT £149 plus 3 x £100



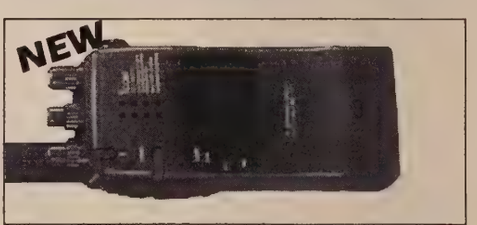
FRG 100 New arrival high performer rx 50k-30MHz. Ultra stable. Ideal decoder!
DEPOSIT £199.99 plus 3 x £100

FT 290R Mk2 New concept in portable base rigs. Add an optional linear!
DEPOSIT £199.99 plus 3 x £100



FT 5200 Super 'mobile pagers? So hi-tech. Ask Martin for mind blowing details!
DEPOSIT £ 235 plus 9 X £55.55

FT 736 R VHF/UHF base with 25w on 2m and 70cms. Special price just for you!
DEPOSIT £569 plus 9 x £111.11



ICW21E Super handy TCVR's . Receives both 2m and 70cms simultaneously.
DEPOSIT £131 plus 3 x £98

Guide to Amateur Radio Shopping in the U.K...

Remember! Buying Amateur radio Equipment is expensive and can be a risky business, especially when using Mail-Order. You may well see better prices advertised elsewhere, but when you next get a quotation, before parting with your hard earned cash, THINK ABOUT THE FOLLOWING:–

1/ Is the equipment to full U.K. spec?

2/ Has the equipment been tampered with in the U.K. to meet U.K. factory specification, or is it FACTORY FRESH SEALED FROM JAPAN?

3/ Is the serial number logged with the official U.K. Distributor for possible contact on updated modifications to your new purchase? If so – ask what is the serial number?

4/ Do you see an advertised price, go to place an order, only to be told to ADD 3.5% to use your credit card?

MARTIN LYNCH
G4HKS
THE AMATEUR RADIO EXCHANGE CENTRE

MARTIN LYNCH £25 GIFT VOUCHERS
Still a super way to handle the headache of buying gifts! No time limit on spending...top up with anything legal. Wonga is ideal! (see above)

CALL, WRITE, OR FAX FOR YOUR 4 PAGE COLOUR MARTIN LYNCH NEWSLETTER PACKED WITH GOODIES, BARGAINS AND INTERESTING NEWS. WOULD YOU LIKE TO CONTRIBUTE?

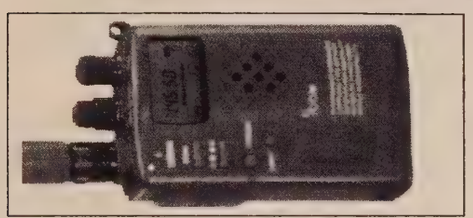
LYNCH

WE ARE THE CLOSEST STORE TO HEATHROW ON THE PICCADILLY LINE - JUST ACROSS THE ROAD FROM NORTHFIELDS UNDERGROUND STATION

WITH 9 MONTHS TO PAY!!!

I've listed some typical examples for you to see, but it's available on all new equipment - if you don't see the item you want listed - GIVE ME A CALL NOW. Just dial 081- 566 1120 for an instant quotation today! (Remember too, the MARTIN LYNCH PRICE PROMISE is still in force. If you are offered a better deal in writing from any other U.K. dealer, show it to me and I'll match it....I must be crazy!

Interest Free - ZERO % APR !!



IC2i So do I...never mind! Liked the IC2S range of 2m handies? You'll love this.
DEPOSIT £44 plus 3 x £75

IC275H -'H' for hi-power. 100w on 2m.It's so good I actually use one myself!
DEPOSIT £275 plus 9 x £100

IC 729 100w on HF and 10w on 6m plus PBT and speech processor. Lovely Jubbly!
DEPOSIT £285 plus 9 x £100

IC 3230H 2m/70 rx 2 bands simultaneously. Built in duplexer. Guaranteed divorce!
DEPOSIT £175 plus 9 x £55.55

DJ 180E State of the art 2m econ. tcvr. So small you'll lose it, and buy another from me!
£169 TOO CHEAP FOR INTEREST FREE!

DJ 580E Dual band. W & S can still retire on this one. Smooth talking bar stewards!
DEPOSIT £89 plus 3 x £100

TS 850S 100w HF for purists. So many chips with this one you'll need vinegar.
DEPOSIT £499.95 plus 9 x £122.21

TS 450S 100w hf multimode. Gen. cov rx and all the trimmings of high performance.
DEPOSIT £249.95 plus 9 x £100

TS 690S As 450 but separate ant connector + 50w on 50 Mhz. Real leading edge stuff!
DEPOSIT £399.95 plus 9 x £111.11

5/ Do you see an advertised price, phone to place an order only to be told that 'the last one went this morning', BUT ENCOURAGED TO SEND A DEPOSIT and you'll get it sometime in the future?
6/ Visit the supplier to view your latest probable purchase, only to find NO STOCK WHATSOEVER – not even empty cardboard boxes?
7/ Is the supplier AUTHORISED BY THE OFFICIAL DISTRIBUTORS IN THE U.K. TO SELL YOU THE EQUIPMENT, guaranteeing you spares, latest mods, and full accessory back-up? This is important, whatever you are told, there are good reasons why retailers are not 'appointed' to sell you U.K. approved equipment. Contact the Distributors for a full explanation.
8/ Ask about accessories, only to be told that SUPPLY ISN'T AVAILABLE!

The list is endless – USE YOUR DISCRETION, there's nothing wrong with shopping around, I do it myself...who doesn't? THE BITTER TASTE OF POOR SERVICE REMAINS LONG AFTER THE SWEET TASTE OF LOW PRICE IS FORGOTTEN...

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Gordon G3LEQ & John G8VIQ at Birmingham, Chris G8GKC at Herne Bay and Doug G0LUH & Paul G7MNI in our new London Store are all looking forward to seeing you.

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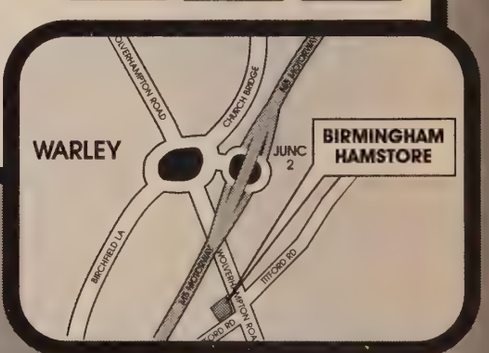

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Fax: 081 202 8873

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Industrial Estate, Sea Street,
Herne Bay, Kent CT6 8LD.
Tel: 0227 741555
Fax: 0227 741742

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ALL STORES OPEN TUESDAYS TO FRIDAYS 09:00 - 17:00 & 09:00 - 16:00 SATURDAYS. N.B. Herne Bay closed for lunch 1300-1400

Keylines

Packet radio enthusiasts among *PW* readers will be pleased to learn that, despite my news in last month's issue, 'Packet Panorama' will be appearing every month. Roger Cooke G3LDI will continue to explore the packet world, and on his monthly page, he'll bring news, reviews and something for those keen to discover packet for themselves.

'Satellite Scene' will also continue to appear monthly, and Pat Gowen G3IOR will take his regular look at amateur radio in orbit. In his new single-page format, Pat will be aiming to pass on the latest launch details, news from around the world and something for anyone new to amateur radio in space.

This month, *PW* has another new feature, which is aimed purely at helping the reader. The 'Arcade' section, to the rear of the magazine, as its name suggests, is designed so that the reader can find important services and information in one place.

The *PW* 'Arcade' will be open for business from now on. You'll find the Book Service, Subscriber's Club, special coupons, magazine information and all our 'essential services' gathered under one roof, so to speak. I think that readers will think the title of the new section to be rather apt!

Recently, I've had several letters on the subject of a 'No Code HF Licence'. Interested readers have brought to my attention the proposals, at the discussion stage at the time of writing, on the possibilities of such a facility.

If you're a member of the RSGB, you'll have received notification of the proposals. The Society are asking members what they think, before the possible negotiations begin.

Of the letters I've received so far, there doesn't seem to be any strongly felt objections. In fact, one letter writer reminded me that there's no longer an international requirement for ship's radio officers to be able to read Morse.

So, what do you think? Do you consider that a specific working requirement of the Morse code should remain for h.f. operation? Or do you think that you should be able to work on h.f. without knowing any Morse? I would be most interested to hear reader's opinions on this point. Speaking for myself, I get a great deal of pleasure from operating on c.w. As many of you know, I like to talk, and when operating in Morse, unlike normal speech, I always know when I'm talking too much...because my arm starts to ache! Even though there are many keen c.w. operators, should we here in the 1990s still **force** everyone operating on h.f. to learn Morse? Although the Royal Signals and Royal Navy confirmed they still teach the code, I understand that the ability to read Morse won't be necessary for marine radio operators quite soon. So, perhaps it's time for the amateur radio hobby to take another look at the necessity to learn the code.

What do you think?

Rob Mannion G3XFD

COMPETITION CORNER
Spot The Rig

Have a go and try and identify this month's puzzle rig - it's more difficult than you think. Steve Hunt our Art Editor, modified the photograph of the well-known piece of equipment just before Christmas (need we say more?). We look forward to receiving your entry!

First Prize
A year's subscription to *Practical Wireless* or a £20 book voucher.

Second Prize
Six month subscription or £10 book voucher

❑ Subscription ❑ Voucher

Name.....

Address.....

.....

.....

.....

I think this rig is an....

Send your entry (photocopies acceptable with corner coupon) to: Competition Corner, Spot The Rig Competition, February '93, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Editor's decision on the winner is final and no correspondence will be entered into. Entries to reach us by Friday 26 February 1993.

Competition Corner Feb '93

Receiving You

Dear Sir

I liked your October issue of *Practical Wireless,* and it brought back a lot of memories. Especially the 'Using those Versatile Vacuums' and the 'Magic Eye Grid Dip Oscillator'.

Some time ago I built a g.d.o. using f.e.t.s and built it in an Eddystone die-cast box. But when I completed it after hunting around for the f.e.t.s. I found it did not work, and it had blown f.e.t.s. The coils I made, are for approximately 145 to 450MHz, this is the range I am interested in.

I've now completed it as far as I can go, and I've even made the power supply. The only part I'm hunting for is the magic eye valve to complete it. I've got all faith in this circuit of working. I am unemployed and cannot afford much money to spend on my projects. I have to hunt around the rubbish skips and dustbins for most things. Can anyone please donate a magic eye?

Ian Ruddock G8NCZ
Harlow
Essex

Editor's reply: Ian should have his magic eye by the time this issue of *PW* appears. I hope you find it useful Ian.

Dear Sir

As a licensed amateur, I like to have a shot at making up the odd circuit board now and again, but lack the space for the equipment needed, or the time and facilities to fabricate p.c.b layouts from scratch. Your excellent magazine often prints track layouts for circuits, which with the best will in the world are hard to copy or duplicate if you do not have access to a photocopier, etc!

What are your opinions as to the feasibility of the following idea? How about component catalogues, list sheets of tracks and pin layouts for you to lay out your own circuits, by rubbing down the required image.

Could not this process be developed, to enable a complete circuit to be rubbed-down onto a prepared copper clad board? This would ease the problem of duplicating circuit layouts, and would, if printing was to the correct size, enable a perfect copy to be made. The layout on the other side of a double-sided board could also be printed by this method. A one-sided board, by the use of a water-soaked paint transfer could be used to print component positions, etc., after the board had been etched, achieving a professional finish.

This is of course an idea in outline, and may well have been thought of before, I would however appreciate your thoughts on the practical and economic use of the suggestion. I feel sure that quite a lot of people would construct many more projects if this system works. I cannot claim to have invented the system, but would lay claim to the implementation!

Jack King G4EMC
Aylesford
Kent

Editor's reply: Your suggestion seems a good one to me Jack. I would be very interested to hear if readers would find the idea useful.

Dear Sir

Regarding your lack of knowledge on Mr H. J. Van der Bijl, mentioned in *Practical Wireless* September 1992 page 22. I am including an article out of the *Standard Encyclopaedia of Southern Africa* (SESA) on Mr Van der Bijl. Hope you will find it interesting. Your magazine's articles and layout is very neat, and the quality of the drawings very professional.

D. Z. Visser
Cape Province
Republic of South Africa

Editor's comment: Thank you Mr Visser. I passed on your information on your late countryman Mr Van der Bijl's contribution to radio, to George Dobbs G3RJV. No doubt, George will share it with us soon.

★★★★ Star Letter ★★★★

Dear Sir

I write regarding the last two editions of *PW* with emphasis in QSOs in foreign languages. I have to tell you that I found myself completely useless when trying to use all my five languages I normally speak.

This is because in the other end, the reply forcibly comes in broken English, the real international language all we foreigners speak.

Frankly, I cannot understand why English language speakers insist in learning another language. It is a complete waste of time, when they are in a superior advantage as masters of Queen's English!

Lenio Marobin PY3DF
Brazil

Editor's reply: Thank you for your letter Lenio. Your excellent written English seems to add emphasis to your point. However, I feel that I can get more out of life and my hobby by learning other languages. It also means I can read some more of the foreign language amateur radio magazines that regularly arrive in the office!

Dear Sir

It was with great interest that I read 'Learning Foreign Languages' by Angelika Voss, as I am not a linguist, languages are a sort of hobby with me. In her text, the author made mention of Esperanto, and it's this topic which I'm writing about.

I was persuaded by a school friend in 1937 to learn Esperanto. This I did quite quickly, having been brought up on a diet of French, Latin, Greek and some scientific German.

By the pen-pal route, I very soon put it to use, reviving the local Esperanto Group. I had cycling holidays in Holland in 1938/9, meeting many Esperantists on the way.

The language was devised and published in 1887 by Dr L. L. Zamenhof, a Polish occulist, under the pseudonym Dr Esperanto ('one who hopes'). He hoped it would become everybody's second language, thus making international understanding easy. This has not happened as he wished, but it has nevertheless spread world-wide.

At the annual *Universala Kongreso de Esperanto* this summer in Vienna, there were over 3000 people from 69 countries, all happily chatting together!

As for amateur radio, there's ILERS (*Internacia Ligo de Esperantistaj Radio-Amatoroj,* which hardly needs translating!), with contacts occurring on a regular basis and with a well attended contest every November.

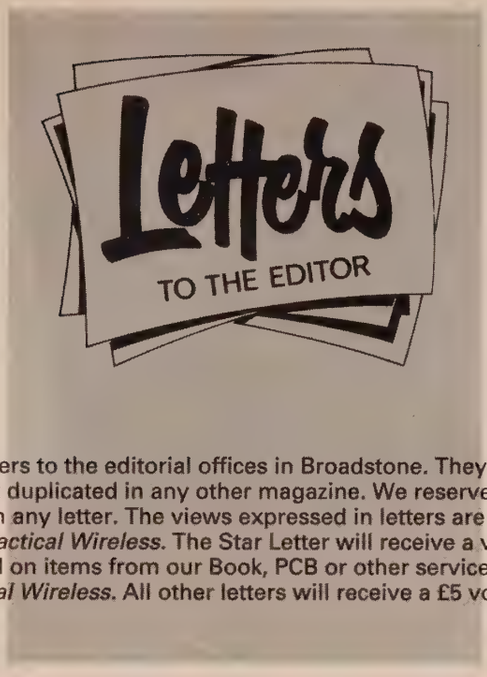
Any Esperantist radio amateur wishing to join in, is invited to contact **Barry Foreman G0EXS, 10 Wilmington Close, Brighton BN1 8JE**. Those wanting information on Esperanto are invited to write to: **Esperanto-Associo de Britujo, 140 Holland Park Avenue, London W11 4UF,** who offer a free introductory correspondence course.

I have been using Esperanto from time-to-time on the air ever since I was licensed in 1948. I have no regrets about learning it, having made many friends in various countries.

Mi anticipas kontakton kun vi en la estonteco!

Walter Farrar G3ESP
Ackworth, Pontefract

Editor's comment: I had the pleasure of meeting G3ESP at the Rochdale QRP Convention in October. I think his callsign is most appropriate!



Send your letters to the editorial offices in Broadstone. They must be original, and not duplicated in any other magazine. We reserve the right to edit or shorten any letter. The views expressed in letters are not necessarily those of *Practical Wireless*. The Star Letter will receive a voucher worth £10 to spend on items from our Book, PCB or other services offered by *Practical Wireless*. All other letters will receive a £5 voucher.

Dear Sir

With reference to 'Keylines' report of Mr Burton's licensing experience with Subscription Services Ltd., it would appear that the licensing authority has now got its act together.

The following is a timetable of my experience:

RSGB Morse Test .....17 October 1992
Slip from RSGB announcing a Pass.....22 October 1992
Acknowledgement of my application received form SSL.....24 October 1992
Licence received from SSL .....29 October 1992

The above reflects considerable merit, not only on SSL, but also on the RSGB examiners, and the RSGB HQ staff for processing the paperwork so expeditiously.

Incidentally when mentioning my experience to another recently licensed amateur, G0RTF, he stated that his had been a similar experience. Normally I am too indolent to put pen to paper, but I felt that the improved performance of SSL merited some effort on my part.

PS: As an amateur recently 'returned to the fold' (I had an AA licence in 1933), may I say how much I have enjoyed reading the articles and letters in the Jubilee and other recent issues of *PW*, relating to the radio scene of those distant years.

E. T. Wadsworth G0SPD
Amersham
Buckinghamshire

Editor's reply: I was pleased to hear of your satisfaction Mr Wadsworth, and I hope you enjoy your return to the hobby. Thanks for the comments on the magazine and the early days of radio. I think you'll enjoy Ron Ham's new column 'Valves & Vintage', which starts this month.

Dear Sir

Reference The Greater London Amateur Radio and Computer Show. Having just been all the way to Harrow for the above show only to find it cancelled, may I suggest that you insist that organisers must supply a telephone number with their copy, when advertising such events? If this had been done, it would have saved me and many others a long wasted journey.

I should be pleased if you can also find out why it should have been necessary to cancel such a popular event. Your comments will be appreciated.

Peter Lepino
Great Bookham
Surrey

Editor's reply: The editorial team were saddened to hear of your wasted journey Peter. We publish such information in good faith, and weren't told that this event was cancelled, or why. In future, we shall continue to urge readers to check before leaving, when we have been provided with a telephone number by the organisers.

New address:
***PW* and *Short Wave Magazine* have moved to Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.**
Full details on page 50.

Radio Diary

* Practical Wireless & Short Wave Magazine in attendance.

If you're travelling long distances to rallies, it could be worth 'phoning the contact number before setting off, to check all is well.

January 24: The Lancastrian Rally will be held at the University of Lancaster. Doors open 10.30am for the disabled. **Sue G1OHH on (0524) 64239.**

February 7: South Essex ARS Radio Rally will be held at The Paddocks, Long Road (A130), Canvay Island, Essex. Doors open 10am. Trade stands, Bring & Buy, home-made refreshments, free parking. Parking outside main door for disabled visitors. Talk-in on S22. **Ken Hendry G0BBN on (0268) 755350.**

February 21: The East Coast Amateur Radio & Computer Rally will be held at Clacton Leisure Centre, Vista Road, Clacton-on-Sea, Essex. Doors open 10.30am. **Richard (0255) 474292.**

February 27: Tyneside ARS 5th Annual Rally will be held at the Temple Park Leisure Centre in South Shields. All usual trade stands, free parking. Talk-in S22. All the amenities of the Leisure Centre, including heated pool & gymnasium. **Jack Pickersgill G0DZG on 081-265 1718.**

March 13/14: The London Amateur Radio & Computer Show will be held at Picketts Lock Centre, Picketts Lock Lane, Edmonton, London N9. Large trade presence, free parking, lectures, disabled facilities, Bring & Buy, special interest group section. Talk-in on 144 & 430MHz. **(0923) 678770.**

March 21: Tiverton South West Radio Club Mid-Devon Rally will be held at the Pannier Market, Tiverton. Easy access, only minutes from junction 27 on the M5. Two halls of trade stands, free parking, Bring & Buy, snack bar. Club room bar open throughout day. Doors open 10am, talk-in S22. **G4TSW, PO Box 3, Tiverton, Devon.**

March 28: Bournemouth Radio Society's 6th Annual Sale will be held at Kinson Community Centre, Pelhams Park, Millhams Road, Kinson, Bournemouth. Doors open 11am to 5pm. Talk-in from G1BRS on 144MHz S22. Amateur radio & computer traders, clubs & specialised groups. Refreshments. Admission £1, including free raffle ticket. **Ian G2BDV on (0202) 886887.**

April 18: Marske-by-the-Sea Radio Rally will be held in the Marske Leisure Centre, High Street, Marske-by-the-Sea, near Saltburn. Doors open 11am. Usual traders, Bring & Buy & refreshments. Talk-in S22. **Mic G7ION on (0287) 610030.**

April 26: The Bury (Lanchashire) RS will be holding another Hamfeast/Rally at the Leisure Centre, Bolton Street, Bury. **Laurence G4KLT on 061-762 9308.**

May 3: Dartmoor Radio Club Rally will be held at Yelverton War Memorial Village Hall, Meavy Lane, Yelverton, Devon. Doors open 10.30am. Talk-in S22. **Ron G7LLG on (0822) 852586.**

May 9: The 9th Yeovil QRP Convention will be held at the Preston Centre, Monks Dale, Yeovil, Somerset. Featuring lectures, displays of home-made QRP equipment & vintage radio, on-air QRP stations & trade stands. Refreshments, doors open 9am, admission £1.50, talk-in S22. This convention is not a rally, but a convention for amateurs not only to attend interesting lectures about the technology & practice of low power communication, but also to meet other QRPers. There will also be the usual friendly QRP Contest on 3.5 & 7MHz, during the evenings of the previous week. This event is known as the QRP 'Funrun'. **Peter Burridge G3CQR, 9 Quarr Drive, Sherbourne, Dorset DT9 4HZ. Tel: (0935) 813054.**

May 16: The 2nd National Vintage Communications Fair will be held at the NEC, Birmingham. Doors open 10.30am to 5pm. Hundreds of items for sale, including vintage radios, telephones, gramophones, jukeboxes, radiograms, etc. Admission will be £3. **Jonathan Hill on (0398) 331532.**

May 30: Maidstone YMCA Radio Rally will be held at YMCA Sportscentre, Melrose Close, Maidstone, Kent ME15 6BD. Doors open 10.30am (10am for disabled). Entry is £1 per adult. Exhibition station GX3TRF (on h.f.). All-day video show for juniors. Refreshments & snacks available. Bring & Buy tables for hire. **Brenda Puncher G0IJK on (0622) 850277.**

Newsdesk '93

Kenwood Amateur Radio Launch

The photograph shows Kenwood amateur radio dealers attending the launch of a new nationwide dealership at Kenwood's UK headquarters in Watford. As of 1 December 1992, Kenwood took over distribution of its amateur radio products in the UK and Ireland. Distribution was previously carried out by Lowe Electronics.

Maplin CD Earphones

New to Maplin Electronics are the CD Earphones - part of the large range of earphones featured in the *1993 Maplin Buyer's Guide.*

The inner earphone set, supplied in a tough plastic carrying case, are so compact they can be taken and worn anywhere. They are ideal for travelling, feature great sound quality and offer excellent value for money at just £4.95 (including VAT).

Lightweight and comfortable to wear, they are ideally suited for listening to CD and digital material, in particular portable CD players and personal stereos.

The lightweight, sensitive unit has a 1.2m long lead, which is terminated in a gold-plated 3.5mm plug, and a converter plug is included to use with standard $^1/_4$in sockets.

Specifications: sensitivity 102dB/mW; frequency response 20Hz to 20kHz; weight (excl. cord) approximately 5g.

Order details: CD Earphones BZ59P.

Maplin Electronics
PO Box 3
Rayleigh
Essex SS6 8LR.
Tel: (0702) 552911
Enquiries.

Liverpool & DARS 80th Birthday Award

The Liverpool & DARS 80th Birthday Award has been introduced to celebrate the 80th birthday of the Society. The award is open to any licensed amateur or short wave listener living outside the postcode boundaries of Liverpool.

Duration: between 1 January 1993 and 31 August 1993.

Frequencies: any for which amateur is licensed.

Scoring: One point will be awarded for each contact with a member of the Liverpool & DARS on each band or mode. Three points will be awarded for each contact with a special club station e.g. G3AHD, G8WCL or any special event stations run by the society.

Logs: These must include date, time, band and mode (for s.w.l.s, the callsign of the station worked must also be clearly shown).

Logs must be sent to G0IFK no later than the 30th September 1993 and must include an s.s.a.e. (DX two IRCs).

First prize is a trophy and runner-up certificates are also available.

A full copy of the rules and a list of current members of the Society are available from G0IFK and each station will receive a full award list.

M. Faulkner G0IFK
17 Lynnbank Road
Liverpool
L18 3HE.

Conviction

At Sale Magistrates Court in Cheshire on 29 May 1992, two radio amateurs were convicted under Section 1 of the Wireless Telegraphy Act 1949, having pleaded guilty to charges of using radio apparatus other than in accordance with a licence. The defendants, Mr Gale Heslop and Mr James Barton, were conditionally discharged and ordered to pay costs of £112 each. All equipment was forfeited.

Pocket-Sized Communication!

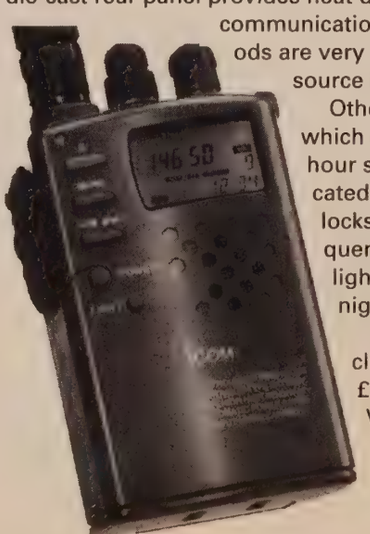
Icom have great pleasure in introducing the IC-2iA/E 144MHz and IC-4iA/E ultra-slim size transceivers, designed for maximum portability and convenience.

Including a NiCad battery pack, these slim transceivers can fit in your shirt pocket, inner jacket pocket or jeans pocket, as well as a handbag.

One of the slimmest transceivers around, they measure only 58(w)x91(h)x30(d)mm* and weigh only 260g* including the BP-121 400mAh battery pack. *2.3(w)x3.6(h)x1.2(d)in.; 9.1oz.

Ergonomically engineered switches and controls are arranged on the stream-lined body of the transceiver. And, the jacks are positioned on the side panel, leaving the top panel uncluttered. All labels are printed in clear, large, letters. Therefore, easy and comfortable operation is ensured.

The output power can be selected from 5W*, 2.5W, 500mW and 20mW (output miser) for your operating convenience. With the 5W output, long distance communication is possible, and a large aluminium die-cast rear panel provides heat dissipation. With the 20mW output, communication range is short, but operating periods are very long. *An external 13.8V d.c. power source is necessary for 5W output.



Other features are: 10 memory channels which can store repeater information; 24-hour system clock which is constantly indicated; lock function which electronically locks switches to prevent accidental frequency changes and function access; LCD lighting with a five second off-timer for night-time operation.

The IC-2iE comes complete with belt clip, wrist strap and charger. Priced at £255, inclusive of VAT (£217.02 ex. VAT).

Icom (UK) Ltd., Sea Street
Herne Bay, Kent CT6 8LD.
Tel: (0227) 741741.

Newsdesk .93

Dorset Morse Festival Weekend 1993

Are you keen on Morse? Do you want to take the test, or make a final practice before taking the plunge? If so, then why not join The First Clayesmore Morse Festival Weekend, on Saturday and Sunday March 27 and 28th.

There will be trade stands, RSGB Morse tests and lectures. The organisers say you'll also have the chance to meet other c.w. enthusiasts!

The Morse Festival, hosted by the school radio society G0RSC, is to be held at Clayesmore School, between Shaftesbury and Blandford, in Dorset. The festival runs from 10am Saturday to mid-day on the Sunday. Morse fans can go for the day, or stay for the weekend. Overnight accommodation and food will be available at the school, at an inclusive reasonable price.

Full details are included in the Morse Festival Information Pack, which is available by sending an A4 s.a.e. to

'Dorset Morse Festival Weekend'
Clayesmore School
Iwerne Minster
Blandford
Dorset DT11 8PH.

Buccaneer Seal Survey

A. F. Bulgin & Company, have been working closely with Conservation and Technical Officers of the Dyfed Wildlife Trust over the past three years. This has been in order to provide durable and dependable connections for the various complex arrays of electrical and electronic equipment used in their field studies.

The latest in these developments is a complete electronic connection system for their new 6.5m Tornado - Rigid Hull - inflatable recently launched in order to carry out the Atlantic Grey Seal Census.

Under the control of the Country Side Council for Wales, Pembrokeshire National Park, The Dyfed Wildlife Trust and the National Trust, the team's three year project is to count all Atlantic Grey Seal pups born from September to January each year. The Coastal area from Aberystwyth to Tenby is to be swept every 15 days to count and dye-mark Seal pups before they leave their beaches and caves.

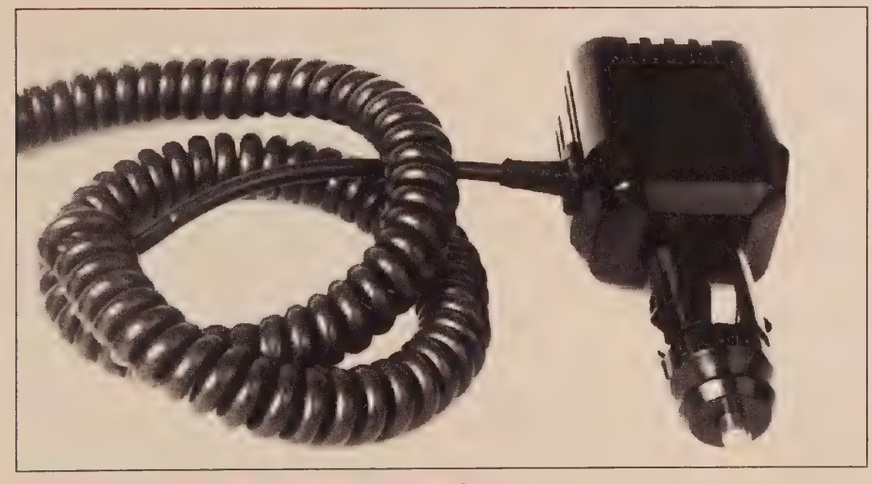
In the arduous winter conditions, the call for high quality products is paramount. All on-board, survey, datalogging and lighting electrical and electronic equipment is connected by using various types from the Buccaneer Range, providing cable to cable, surface fitting and through panel mounting versions for power and BNC connections, together with standard sealing caps which enables equipment to be removed for service or security.

The Bulgin range is fully approved to IP68 and BS5490: 1977. It's also accepted by Lloyds Register of Shipping and is now available in half-size mini-Buccaneer providing a further range of 23 types.

A. F. Bulgin & Co. Plc, Bypass Road, Barking, Essex IG11 0AZ.
Tel: 081-594 5588.

New Look RadioLine

January 9 saw the first edition of the 'new look' RadioLine from *Short Wave Magazine.* Professionally produced, it now includes news, views, station idents and signature tunes, big prize write-in competitions and a monthly technical feature on various aspects of short wave listening. Subscribers - listen-in for the prize subscriber number - and if it's yours, let *Short Wave Magazine* know and a prize will be on its way to you! So, make a note of the RadioLine number **(0891) 654676**. Updated each Saturday, calls charged at 36p per minute cheap rate, 48p per minute at all other times.



New In-Car DC Plug Adaptor

Technotrend are manufacturing a new quality 'in-car' d.c. plug adaptor, designed to ensure consistently reliable contact with all common types of vehicle cigar lighter sockets.

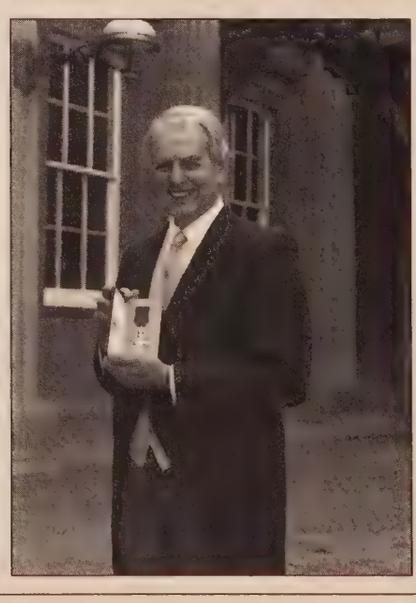
Incorporated in the adaptor is a universal mounting stainless steel, four-pronged grounding contact and spring-loaded fuse housing. It is supplied with an l.e.d. indication of power and high quality curled cable for connection.

This versatile product can be used to charge small electronics equipment, NiCad batteries, etc., or as a regulated d.c. power supply for personal stereos, cellular telephones, portable computers, fluorescent d.c. lights, emergency flashing lights, d.f. equipment, etc.

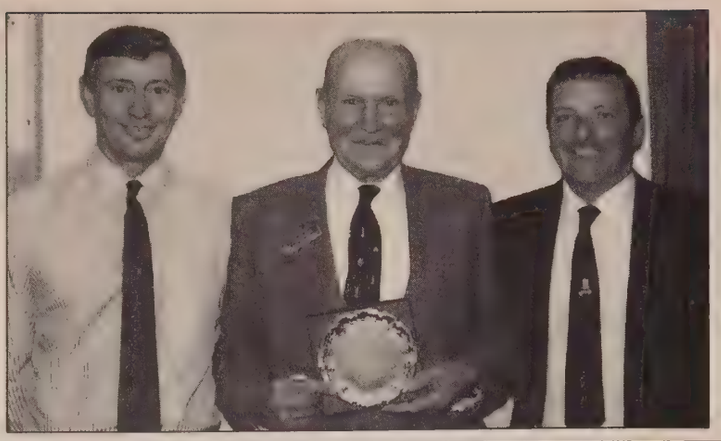
For further information, contact **Barry Bateman on (0252) 373242.**

Solihull ARS Chairman Honoured

Tony Plant G3NXC, attended a recent Investiture at Buckingham Palace to receive an MBE. Tony, who is Chairman of the Solihull ARS, was awarded the honour for services to the aerospace industry.



Newsdesk



Pioneering Work On 50MHz

Pictured here is Major Ken Ellis G5KW (centre) receiving a silver salver when he visited Jersey in late October for his pioneering work on 50MHz. The salver was presented by Geoff Brown GJ4ICD, Chairman of the UKSMG (left) and Mike Turner GJ0PDJ, Jersey ARS President (right) .

Stolen

Stolen in the Edinburgh area, Icom Receiver model IC-R9000 serial no. 01060. Any information to **PC M. Forsyth (PC3467) Lothian & Borders police on (0506) 31200 (24 hours).**

Dubus

Dubus is the Anglo-German magazine published by amateurs, for amateurs. It is a non-profit making organisation, and the magazine contains no advertisements.

Based upon the v.h.f./u.h.f./s.h.f. aspects of amateur radio, *Dubus* provides articles on antennas, filters, wave guides, measuring equipment, oscillators, power amps, pre-amps, receivers, transmitters and transverters. Test reports on manufacturers devices and products appropriate to *Dubus* projects are included. Also, information on technical topics, hints and kinks, meteor-scatter, aurora, tropo, contest news, and lots more.

A yearly subscription of four issues, costs £13.25.

Ken Hatton G4IZW
Hamilton House, Boat Road,
Bellingham, Hexham,
Northumberland NE48 2AP.
Tel: (0434) 220636.

Children In Need Appeal

The Submarine ARC based at *HMS Dolphin*, Gosport, put on a sponsored station GB0NC on Saturday 14 and Sunday 15 November, in aid of the BBC Children In Need Appeal.

The station was operated from the Southampton College of Higher Education Warsash Campus, by kind permission of the principal.

The QSL cards were paid for by Anchor Surplus of Nottingham, and the total number of contacts was 329. The amount raised will be in the region of £250.

The Submarine ARC thank everyone who worked the station.

Great Ormond Street Hospital

Between 24th and the 27th of February 1993, a special event station is to be held at the Great Ormond Street Hospital in London.

Operating frequencies will be 3.740, 7.070, 14.170, 21.170 and 50MHz, plus 144 and 430MHz, between 8am and 8pm.

All radio equipment for the above bands will be supplied by South Midlands Communications, whilst Waters & Stanton are supplying antennas.

The event has two purposes, to raise as much as possible for the hospital, and also to widen awareness of the Novice licence. The event will be opened at approximately 10.45 by the Duke of Edinburgh, in an opening contact with King Hussein of Jordan.

The station is hoping to gain a sponsorship from the 'individual' and company alike, on a cost per contact basis, although a fixed sum would be most appreciated.

A target of 300 contacts per day has been set. While this isn't high for three transceivers and five operators, a contest style operation is not intended, giving plenty of time for children, staff and guests of the hospital to speak with amateurs.

A vehicle anti-theft system has kindly been donated by Vecta (Essex), worth over £400, which will be awarded to the person raising the highest amount above £400.

If you would like to make a donation, or would like to have a sponsor pack sent, then please call **Pippa Foreman at Great Ormond Street Fund-Raising Department on 071-916 5678.**

The Golden Antenna

Every year, on the occasion of the German-Dutch Radio Amateur Festival (DNAT), the Town of Bad Bentheim awards the 'Golden Antenna' to radio amateurs for an exceptional humanitarian deed in the field of amateur radio.

This award has, up to now, been given to radio amateurs from many countries.

The 12th award of the 'Golden Antenna' is to take place on the occasion of the 25th German-Dutch Radio Amateur Festival, on 27 August 1993, in Bad Bentheim.

Radio amateur organisations all over the world, as well as every radio amateur and every individual who has been helped in any way by radio amateurs, are called upon to submit proposals for individuals or groups of radio amateurs. The respective detailed documents, substantiating their proposal, must be received by 15 May 1993, at the latest, to the following address:

Stadt Bad Bentheim
PO Box 1452
D4444 Bad Bentheim

The jury will be considering proposals referring to the period of time between 1 September 1991 to 31 April 1993.

Those eligible for the award include individuals, as well as groups of licensed radio amateurs who, in emergency situations, rendered their services to other people self-sacrificingly. The services may be rendered in the humanitarian field or in connection with rescue operations on the occasion of military conflicts, disasters and catastrophes. The only thing that counts is that radio amateur broadcasting has played an important part in the rendering of the humanitarian deed.

The town of Bad Bentheim will invite the award winner to the ceremony, defraying the cost for travel as well as for accommodation.

Club News

Antrim

Carrickfergus AG. Tuesdays, 7pm. Downshire Community School, Downshire Road, Carrickfergus. February 2 - 70cm & Upwards by Ian Kyle GI8AYZ. **Gavin on (0232) 835650.**

Berkshire

Maidenhead & DARC. The Red Cross Hall, The Crescent, Maidenhead, 7.30pm. January 19 - 'Moonbounce (EME)' by Ian G3SEK, February 4 - 'The History of GB2SM (Science Museum) by Geoff G3JUL. **Neil G8XYN on (0628) 25952**.

Newbury & DARS. Wednesdays, 7.30pm. Bucklebury Memorial Hall. January 27 - Electronic Junk Sale. **(0635) 46241.**

Buckinghamshire

Aylesbury Vale RS. 1st & 3rd Wednesdays, 8pm. Village Hall at Hardwick. January 20 - AVRS vs Chesham & DARS Quiz. **Martyn G4XZJ on (0296) 81097.**

Cheshire

Chester & DRS. Upton Recreation Centre, Cheshire County Sports & Social Club, Plas Newton Lane, Chester CH2 1PR. **David Hicks G6IFA on (0244) 336639 or Sid Ainsworth G0HTP on 051-355 2833.**

Stockport RS. 2nd & 4th Wednesdays, 7.45pm. Room 14, Dialstone Centre, Lisburne Lane, Offerton, Stockport, Cheshire. January 27 - Oldham Blue Coates School by R. Thorley G0GDN, February 10 - Computers by G. Bleads G0HJQ. **Jim France G3KAF on 061-439 4952. Clwyd**

Rhyl & DARC. 1st & 3rd Mondays, 8pm. WRVS Centre, 116 Vale Road, Rhyl. January 18 - ATV Demo GW3JGA, 25th - CD ROM Demo GW4AMZ. **Ken Padley GW7IAR on (0745) 338276.**

Wrexham ARS. Maesgwyn Community Centre, Maesgwyn Road, Wrexham. January 19 - visit to British Telecom, Oswestry, February 16 - video night - Amateur television. **Ian Wright GW1MVL on (0978) 845858.**

Cornwall

Cornish RAC. Village Hall, Perranwell Station, Perranwell, nr. Truro, 7.30pm. February 4 - a talk by St John's Ambulance Service, 9th - Activities night. **Geoff Bate on (0209) 820836.**

Derbyshire

Buxton Radio Amateurs. Lee Wood Hotel, Buxton, 8pm. January 26 - Discussion of FOCUS, Febraury 9 - Basic PC Construction. **Derek Carson G4IHO on (0298) 25506.**

Derby & DARS. Wednesdays, 7.30pm. 119 Green Lane, Derby. January 20 - North American Travels by Martin Shardlow G3SZJ, 27th - The Anaesthetic Room a talk about putting people to sleep, February 3 - Junk Sale, 10th - Video Show. **Richard Buckby G3VGW on (0773) 852475.**

Devon

Appledore & DARC (Devon). 3rd Mondays, 7.30pm. Appledore Football Clubroom. January 18 - Construction night & setting up/tuning of club transceiver by G0DLC. **Reg Lyddon G4ETJ QTHR on (0237) 477301.**

Torbay ARS. Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. January 22 - Contest & Construction night. **Andy Stafford G4VPM on (0803) 329055.**

Down

Bangor & DARS. 1st Fridays, 8pm. Winston Hotel, Queens Parade, Bangor, Co. Down. February 5 - visit to the electronics department, Bangor Technical College for practical demonstration on curing TVI part 2. **Des Buckley GI3HCP on (0247) 460251.**

East Sussex

Southdown ARS. 1st Mondays, 7.30pm. Main hall of the Chaseley Home for Disabled Ex-Servicemen, South Cliff, Eastbourne. Wednesdays (Morse) & Fridays (Novice & RAE), 7.30pm at the clubrooms, Hailsham Leisure Centre, Vicarage Road, Hailsham. February 1 - PMR problems by Keith G8HGM. **John Vaughan G3DQY on (0323) 485704.**

Essex

Braintree & DARS. 1st & 3rd Mondays, 8pm. Community Centre, Victoria Street, Braintree. January 18 - G3PEN/G0DEC PMR conversion - theory. **Eddy Scherer, 21 Maysent Avenue, Braintree, Essex CM7 5TZ.**

Chelmsford ARS. 1st Tuesdays, 7.30pm. Marconi College, Arbour Lane, Chelmsford, Essex. February 6 - Packet Radio by John G6JPQ. **Roy & Ela Martyr G3PMX & G6HKM on (0245) 360545.**

Dengie Hundred ARS. 1st & 3rd Mondays. Henry Samuel Hall, Steeple Road, Mayland, Essex. **Tracey on (0621) 783629 after 6pm.**

Greater London

Acton, Brentford & Chiswick ARC. 3rd Tuesdays, 7.30pm. Chiswick Town Hall, Heathfield Terrace, London W4. January 19 - AGM & club quiz. **Colm Mulvany G0JRY on 081-749 9972.**

Clifton ARS . 'Earl of Derby' Public House, Dennetts Road, New Cross, London SE14. January 22 - QRP evening, February 5 - Scanners. **Keith Lewis on 081-859 7630.**

Edgware & DRS. Watling Community Centre, 145 Orange Hill Road, Burnt Oak, 8pm. January 14 - AGM, 16th- Affiliated Societies Contest, 28th - Morse training, February 11 - Model Rockets by Bob Goss G4CQF. **Howard Drury G4HMD on (0923) 822776.**

Silverthorn RC. Fridays, 7.30pm. The Chingford Community & Adult Education Centre, Friday Hill House, Simmons Lane, Chingford, London E4 6JH. January 29 - Worked All Britain Award by Robert Snarey G4OBE. **Andrew Mowbray G0LWS on 081-529 4489 between 5.30 & 6.30pm weekdays only.**

Southgate ARC. Winchmore Hill Cricket Club Pavilion, Firs Lane, Winchmore Hill, London N21. January 14 - The Latest PC Technology by David Goodman, 22nd - Annual Dinner & Social evening, 28th - final preparations for 1993 London Amateur Radio & Computer Show, February 11 - Multi-mode Action on the Air. **Brian Shelton G0MEE on 081-360 2453.**

Gwynedd

Dragon ARC. 1st & 3rd Mondays, 7.30pm. Four Crosses Hotel, Menai Bridge. January 18 - talk on a maritme subject by Bob Williams GW3CGN, February 1 - talk on a technical subject by Geoff Spencer GW4DRR. **Tony Rees GW0FMQ on (0248) 600963**.

Porthmadog & DARS. 3rd Thursdays, 8pm. Harbour Cafe, Ffestiniog Railway, Porthmadog. **Patrick Allely GW3KJW on (0758) 88339.**

Hampshire

Horndean & DARC. 1st Thursdays, 7.30pm. Horndean Community School, Barton Cross (off Catherington Lane), Horndean, Hants. February 4 - Junk Sale. **Stuart Swain G0FYX on (0705) 472846.**

Hertfordshire

Cheshunt & DARC. Wednesdays, 8pm. Church Room, Church Lane, Wormley, nr. Cheshunt, Herts. January 20 - natter night, 27th - Dowsing by Paul G0BQF, February 3 - members' forum, 10th - Junk Sale. **Roger Frisby G4OAA on (0992) 464795.**

Dacorum AR & TS. 1st (informal) & 3rd (formal) Tuesdays, 8pm. The Heath Park, Cotterells, Hemel Hempstead. January 19 - Computers in Amateur Radio by Ian Hamilton RS 94283. **Dennis Boast G1AKX on (0442) 259620.**

Hoddesdon RC. Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon,

Club News

Herts. January 21 - Talk by Brook Verral on His radio collection, February 4 - natter night. **Roy G4UNL on 081-804 5643.**

Stevenage & DARS. Ground Floor Rear Suite, Sitec Building, Ridgemond Park, 7.30pm. January 19 - Arrangements for forthcoming Annual Darts challenge G7IEG, 26th - Sacklog Computer Log Programme by Alan Jubb G3PMR, February 2 - Practical night - h.f. rig checking & alignment, 9th - Woodturning by Frank G4ISO. **Pete Daly G0GTE on (0438) 724991**.

Humberside

Bridlington & DARS . Alternate Thursdays, 7.30pm. Combined Cadet Building at Bridlington Upper School, Bridlington. January 21 - Packet Nodes by Chris G6KIA, February 4 - CW & Raynet by Brian G4XBU. **Norman Bedford G4NJP on (0262) 673635.**

Kent

Sevenoaks & DARS. January 18 - Semiconductor manufacture by Eddie Brownlow. **The Secretary, c/o Sevenoaks District Council, Council Offices, Argyle Road, Sevenoaks, Kent TN13 1HG**.

Lancashire

Hesketh ARC. Every other Tuesday. Birkdale, Southport. January 19 - AGM. **Bernie G7DEM on (0704) 63344.**

Preston ARS. January 21 - AGM - all members to be present please. **Eric Eastwood G1WCQ on (0772) 686708.**

Lincolnshire

Grantham RC. 1st & 3rd Tuesdays, 8pm. Kontak Sports & Social Club, Barrowby Road, Grantham. January 19 - Natter & Noggin night, February 2 - Electric Shock St. Johns Ambulance. **John Kirton G8WWJ on (0476) 65743.**

Merseyside

Liverpool & DARS. Tuesdays, 8pm. Churchill Club, Church Road, Wavertree, Liverpool. January 19 - Construction techniques G0IFK, 26th - Surplus Sale, February 2 - Home-brew Test Gear GFGEB, 9th - Activity Night. **Ian Mant G4WWX on 051-722 1178.**

Wirral & DARC. Irby Cricket Club, Mill Hill Road, Irby, Wirral, 8pm. January 20 - D& W, Black Horse, Lower Heswell, 27th - Surplus equipment sale. **Paul Robinson G0JZP on 051-648 5892.**

Middlesex

Echelford ARS. Community Hall, St. Martin's Court, Kinston Crescent, Ashford, Middlesex, 7.30pm. January 14 - natter night, 28th - Packet Radio for Beginners by Peter Burton G3ZPB, February 11 - Intruder Watch by J. Cleeve G3JVC. **P. Townshend G6PMT on (0344) 843472**.

Norfolk

Dereham ARC. 2nd Thursdays, 8pm. St. Johns Ambulance Hall, Yaxham Road, Dereham. February 11 - SSTV by G4TUK. **Mark Taylor G0LGJ on (0362) 691099.**

Northants

Kettering ARS. Tuesdays, 7.30pm. Electricity Sports & Social Club, Eksdale Street, Kettering. January 26 - Radio Communications by F/O Rose from RAF Wyton. **Len G0RDV (but QTHR as G7EHM) on (0536) 514544**.

Nottinghamshire

Mansfield ARS. Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. February 4 - RSGB Video evening. **Mary G0NZA on (0623) 755288**.

Nottingham ARC. Thursdays, 7.30pm. Sherwood Community Centre, Mansfield Road, Nottingham. January 14 - Morse & The Morse Test by Ron G4NZU, 21st - Construction/Activity/On the Air, 28th - Junk Sale, February 4 - Forum, 11th - Generating your own power. **Ian Miller G4JAE on (0602) 232604.**

South Notts ARC. Highbank Community Centre, Farnborough Road, Clifton Estate, Nottingham, or Fairham Community College, Farnborough Road, Clifton Estate. January 15 - Talk-in/Junk Sale, 22nd - Construction, 29th - on the air, February 5 - Talk-in/Open Forum. **Ray G7ENK on (0602) 841940.**

Scotland

Dundee ARC. Tuesdays, 7pm. College of Further Education, Graham Street, Dundee. January 19 - Construction night, 26th - Members night with John GM3LCP, Allan GM4ZUk & Sam GM2AOL, February 2 - Construction night, 9th - My Father & I by Leslie MacKenzie. **George Millar GM4FSB, 30 Albert Crescent, Newport-on-Tay, Fife DD6 8DT.**

Somerset

Taunton & DARC. 1st & 3rd Fridays, 7.30pm. The Basement, County Hall, The Crescent, Taunton. Other Fridays informally for station operation, Morse code class, natter. January 22 - Weather Satellites by M. Platt MA, February 5 - So you think you know your Amateur Radio by Peter Crosland G6JNS. **Mr Lindsay-Smith G3WNI on (0823) 680778.**

Yeovil ARC. Thursdays. Red Cross HQ, Grove Avenue, Yeovil, Somerset. January 14 - Introduction to Club Project Transmitter Board G3MYM, 21st - 80/20mtr project, Ciruit Theory by G3PCJ, 28th - Completion of club project G3MYM & G3PCJ, February 4 - Satellite Working by G4JBH, 11th - Vintage Radio by G7LNJ. **Cedric White G4JBL on (0258) 73845.**

South Glamorgan

Barry ARS. Alternate Thursdays. Old College Inn. **Ann MacKay GW7LCP, QTHR.**

South Yorkshire

Barnsley & DARC. Mondays. Radio club room & shack, at the rear of the Darton Hotel, Station Road, Darton, Barnsley. January 18 - Lecture to be arranged, 25th - Proposed rig check night by G8OWN, February 1 - on the air night. **Ernie G4LUE on (0226) 716339.**

Suffolk

Sudbury & DARC. 1st Tuesdays, 8pm. Five Bells Inn, Great Cornard, Sudbury, Suffolk. February 2 - Weather Satellites by Mark Clark G3CQL, 7th - Canvey Island Rally. **Colin Muddimer G0PAO on (0787) 77004.**

Surrey

Sutton & Cheam RS. 3rd Thursdays, 7.30pm. Sutton United Football Club, The Borough Sports Ground, Gander Green Lane, Sutton, Surrey. Natter nights - 1st Thursdays. January 21 - Siberian Adventure by Paul G0BXC, 16th - 3.5MHz AFS Contest (s.s.b.), February 4 - natter night. **John Puttock G0BWV, 53 Alexandra Avenue, Sutton SM1 2PA**.

Warwickshire

Stratford-Upon-Avon & DRS. 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Road, Tiddington, Stratford-Upon-Avon, Warwickshire. January 25 - Contesting & IOTA, February 8 - Trials & Tribulations of an o.w.l. by Stan G4AXW. **Alan Beasley G0CXJ on (0608) 82495**.

West Midlands

Barr Beacon RC. 1st Mondays & 3rd Wednesdays, 7.30pm. 112 Walsall Road, Aldridge, West Midlands. **C. J. Baker G0NOL on (0922) 36162.**

West Yorkshire

Keighley ARS. The Ingrow Cricket Club, Ingrow, Keighley, 8pm. January 21 - natter night, 28th - AGM, February 4 - natter night, 11th - night on the air GX0KRS, GX7KRC. **Kathy Conlon G0RLO on (0274) 496222.**

Wiltshire

Trowbridge & DARC. 1st & 3rd Wednesdays, 8pm. Southwick Village Hall, 8pm. February 3 - Surplus equipment sale. **Ian G0GRI on (0225) 864698.**

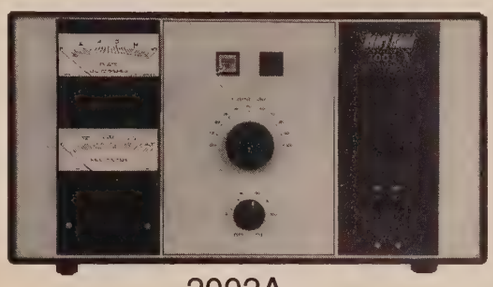
Please send in all of your 'Club News' items to Sharon George at the new editorial offices in Broadstone. Full details on page 50.

LINEAR AMPLIFIERS

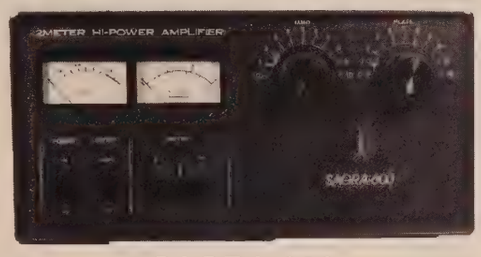
SMC feel we have the best selection of the most popular high quality linear amplifiers all available at very reasonable prices. This range has been chosen by experience built up over many years encompassing many products.

During this time we have seen many other product ranges come and go but we feel that those we stock have passed the test of time and offer the best performance at the price.

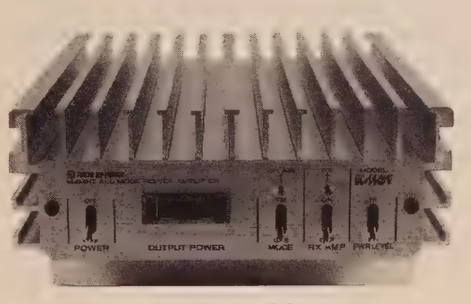
We have a comprehensive range of spares available for most models in the range and can service all of these items in-house.



2002A



SAGRA-600



HL110V

Henry Radio

2002A	*2m 3CX800A7 800W out PEP (typical) 13dB gain*	£1550.00	E
2004A	*70cm 3CX800A7 700W out PEP (typical) 13dB gain*	£1650.00	E
3002A	*2m 8877 1600W out PEP (typical) 13dB gain*	£2895.00	POA
3K Premier	*HF 3CX1200 1800W out PEP (typical) 13dB gain*	£2995.00	POA
5K Classic	*HF pair 3CX1200 4kW out PEP (typical) 13dB gain*	£4250.00	POA

Tokyo Hy-Power HF

HL100B/10	*21-28MHz 10W-100W out*	£210.00	C
HL100B/20	*14MHz 10W-100W out*	£210.00	C
HL100B/80	*3.5MHz 10W-100W out*	£210.00	C
HL1K	*160-10m 1kW PEP input 2x4CX250B*	£999.95	D
HL2K	*160-10m 2kW PEP input 2x3-500Z*	£1599.00	E

Tokyo Hy-Power VHF

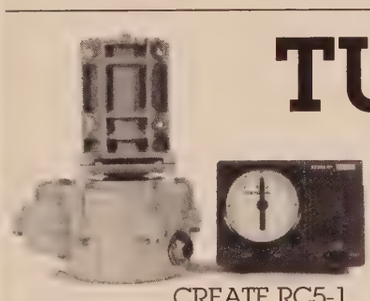
HL37V	*2m 3W-32W pre amp*	£109.00	B
HL62VSX	*2m 5/10/25W in 50W out pre amp*	£195.00	C
HL110V	*2m 2/10W in 100W out pre amp*	£220.00	C
HL180V	*2m 3/10/25W in 170W out pre amp*	£349.00	C
SAGRA600	*2m 15-25W in 600-700W PEP output 2x4CX250B*	£939.00	E
HL66V	*6m 10W in 50-60W out pre amp*	£149.00	C
HL166V	*6m 3/10W in 80/160W out pre amp*	£299.00	C
HL1K/6	*6m 10W in 500W PEP output 2x4CX250B*	£999.95	D
HL36U	*70cm 5/10W in 25-30W out pre amp*	£155.00	B
HL63U	*70cm 10/25W in 50W out pre amp*	£259.00	C
HL130U	*70cm 3/10/25W in 120W out pre amp*	£459.00	C
HL1240U	*23cm 2/10W in 40W out MGF 1202 pre amp*	£599.95	C

Daiwa

LA2080H	*2m 1.5-5W in 30-80W out pre amp*	£159.95	B
DLA80H	*2m/70cm 0.5W-25W in 80W out*		
	2m 60W out 70cms in MGF 1302 pre amp	£385.00	C
	DLA80H - "Ideal for dual band handie or mobiles"		

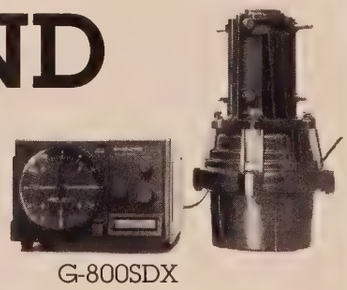
A = £2; B = £5; C = £7.50; D = £12.50; E = £16.50

TURN IT AROUND



CREATE RC5-1

Superb engineering standards combined with pin sharp setting accuracy means new technology from Yaesu & Create. We stock a wide range of rotators to suit all applications from TV to multi-element HF antennas with computer control capability on some of the larger models.



G-800SDX

ROTATORS

G-250	Bell type twist/switch CTL	£89.95	C
G-400	Bell type meter controller	£189.00	C
G-400RC	Bell type round controller	£210.00	C
G-600RC	Bell type round controller	£295.00	C
G-800SDX	Bell type 450 deg. var. speed	£369.00	C
G-1000SDX	Bell type 450 deg. var. speed	£409.00	C
G-2000RC	Bell type round controller	£525.00	C
G-2700SDX	Bell type 450 deg. var. speed	£745.00	E
G-500A	Elevation meter controller	£235.00	C
G-54008	Azimuth/elev. dual control	£429.00	D
G-56008	Azimuth/elev. dual control	£499.00	D
RC5-1	Bell type round controller	£255.00	C
RC5-3	Bell type preset	£319.00	C
RC5A-3	Bell type var. speed. & preset	£475.00	C
RC5B-3	Bell type var. speed. & preset	£729.00	D

COMPUTER INTERFACES FOR G-5400/G-56008

IF-100PC	I/F C/W lead & software IBMPC	£165.00	B
IF-100C64	I/F C/W lead & software CBM64/128	£169.00	B

ROTATOR HARDWARE

GS-050	Rotary bearing 1.5" mast	£23.95	B
GS-065	Rotary bearing 2" mast	£35.50	B
GC-038	Lower mast clamp G-400, 600 etc	£27.45	B
9523	Channel master bearing	£19.95	B
CK46	Rotary bearing 1.5-2.5 mast	£41.00	B
MC1	Lower mast clamp RC5 series	£41.00	C

ROTATOR CONTROL CABLE

RC6W	6 way G-250, 400, 600, RC XR500 per mtr.	£0.74
RC8W	8 way G-2000 create series	£0.88

A = £2.00; B = £5.00; C = £7.50; D = £12.50; E = £16.50

ROTATOR CABLE CARRIAGE
Rotator cable £3.50 up to 20 mtrs. £5.00 over 20 mtrs.

SEE PAGES 4 & 5 FOR ADDRESSES ETC.

A Receiver Consti

Many radio enthusiasts have a pipe dream that they' ll build that 'special' receiver. Roger Bennett G3SIH designed and built his, and now shares some of the experience and ideas gained from the project in the form of a helpful constructor's guide.

There's no doubt in my mind that operating a piece of home-built radio equipment is a revelation. This article covers my experience in building a general coverage receiver, from initial thoughts to completion.

Hopefully, you'll get enough ideas to have a go yourself. You can build a full specification receiver, or attempt a less complex design based on my information and experience.

Short Wave Bands

So that I could listen to the 1.5 to 30MHz bands, I had originally decided to buy a commercial receiver. There was a lot of choice, ranging from surplus equipment to the modern commercial 'black boxes'.

I eventually narrowed the choice down to the Racal RA17 or RA117. Unfortunately, the sheer physical size and weight of the receiver made me think again.

The black boxes were ruled out for other reasons, and I had to think about building a receiver. But, the decision wasn't taken lightly!

As I've said, the decision to build wasn't taken lightly. In fact, I abandoned the idea several times before going ahead.

Even then, I had other problems to consider. What about the circuit, the coils? What about the tuning systems, and so on?

There was a distinct lack of information on building a general coverage receiver. Although, there's adequate published details on building single or two-band receivers using 5 to 5.5MHz, etc.

As single or dual-band receivers cover only narrow frequency ranges, several problems disappear. For example, stability, tracking and receiver drift become less difficult to handle.

Basic Ideas

There are a number of circuits which can be used. The Barlow-Wadley loop system , as used in the Racal receivers, is one.

The Barlow-Wadley loop is rather complex though, and this led me to other techniques. These include single, double or triple conversion and crystal-controlled systems. The crystal-controlled arrangement is generally used for a amateur band receivers, using converters feeding a tuneable intermediate frequency stage.

Single conversion, shown in **Fig. 1a**, is straightforward, but suffers from image problems. Of course, such receivers can be built with a couple of tuned r.f. stages and can give very good results.

Triple conversion, shown in **Fig. 1c**, was used by some manufacturers. They often based it on an i.f. of 1.6MHz, followed by conversion to 455kHz, followed by final conversion of somewhere between 50 and 100kHz.

Sometimes, the receiver final i.f. was either 85 or 100kHz. However, moving the first i.f. up to 3MHz (from the more usual 455kHz) means that the image rejection of the receiver was improved.

The image frequency problem is reduced by the first i.f. being a high frequency. The next conversion ensures a reasonable amount of selectivity, and it enables Q-multipliers, notch filters and the like to be used. The final i.f. allows sharp selectivity.

Dual Conversion

I decided to go for the dual-conversion superhet arrangement, as shown in **Fig. 1b**. My receiver uses both i.c.s. and discrete components.

The circuit I used covers 1.7 to 30MHz without a break. The receiver employs a tuneable i.f. (not shown on the block diagram) which is centred around 1.6MHz, followed by a second i.f. of 455kHz.

The receiver modes are a.m., s.s.b. and f.m. Selectivity is controlled by a commercial home-brew filters.

I decided to use ready-made coils, and based my work on the readily available Toko range. In some cases, these needed modifications to suit my needs.

The difficult part of the receiver, the front end, consists of r.f. stage, mixer and oscillator. The range 1.7 to 30MHz is split into three bands, each with a tuning ratio of 3:1. I chose a tuneable i.f. of 1.35 to 1.85MHz, with the oscillator running 455kHz below the signal frequency circuits.

At this point, you may be wondering why I restricted my design to three ranges, when I could have used more. The reason was so that I could avoid making the receiver switching more complex than necessary.

Band-Switching

The main thing that detracts from building a complex receiver, is the 'rat's nest' that invariably develops around the band-switching. This problem can be avoided by arranging each band to have its own r.f./ mixer/oscillator board.

With the separate board method, everything is simplified. The only switching functions then required are: tuning capacitor, power supply, r.f. gain, antenna and output.

There are other benefits of the separate board approach. Particularly helpful is the fact that the coil, trimmer, padding capacitor and other components are mounted on their own boards. This is very convenient, because when modifications are made, only the board under modification is disturbed.

Stability is also aided by the single-band board method. This is directly due to shorter wiring to the tuning capacitor and band-switching circuits.

Filter Circuits

The T-notch filter is one of the most valuable circuits to be incorporated in a receiver. Generally they are used in receivers with i.f.s of 50, 85, or 100kHz, where the width of the notch is easier to achieve with the lower i.f.

Of paramount importance is the Q of the coil in the resonant circuit. The higher the Q, the better the selectivity. Normally at 455kHz, the selectivity curve will be too wide to be useful with the Q values normally achievable at this frequency.

Fortunately, it's possible to increase the Q value at 455kHz by using the Q-multiplier technique. This is done by providing a controlled amount of feed-back in the circuit, bringing the circuit near to the point of oscillation.

Two automatic gain control (a.g.c.) systems were decided on. One was for a.m. reception, and the other for s.s.b. and c.w. I opted for an audio derived a.g.c. for s.s.b./c.w. reception.

uction Experience

A noise blanker was added as an afterthought, but I incorporated two crystal markers into the design from the outset. The oscillators provided signals at 100 and 500kHz.

The Circuit Boards

Let's look at the circuit boards so far. There's the r.f. amplifier/mixer board, and the tuneable i.f. board.

There's also the main i.f. board, the a.m./s.s.b. detector board and the f.m. detector board. The b.f.o. and crystal calibrator units were also on their own p.c.b.s.

My modular approach was employed throughout the receiver. I used separate boards for the T-notch filter, power supply, audio a.g.c., noise blanker and the audio pre-amplifier.

Mechanical Construction

I gave much thought to the mechanical construction of the receiver. The final decision on how to build, had to revolve around whether to miniaturise the project, or build for experimentation and modification.

In the end, I chose to construct the receiver so it could be easily modified. To do this, I bought a piece of surplus gear built into a 19in rack. After stripping it down, I built the project into the chassis.

Apart from the main physical constructional aspect, the other major mechanical consideration was the tuning mechanism. To make a really good system, you need a good reduction drive, in conjunction with the best tuning scale you can make or find.

There are many ways a good-quality tuning system can be obtained. One of the best, is to use an Eddystone 898 tuning mechanism.

Although they're not made nowadays, the 898 dial can still be found, and they can often be recovered from older home-brew equipment. Other sources of mechanical tuning mechanisms are those from previously scrapped CR100, and AR88 receivers.

Computer Aided Design

I decided to use a computer-aided design (CAD) system to help me produce the tuning dials. But there's nothing to stop you making them by other methods.

The lettering for dials, controls and the rear panels can be made from rub-down lettering. However, if you have access to a computer in your shack, it really is worthwhile using a CAD package if it's available.

It cannot be stressed enough, that spending time on producing a professional-looking dial and control panel is well worth the job. It's really worthwhile spending time on the dial, for there's nothing worse than using a receiver with a mediocre tuning assembly.

Overall Performance

Once I had completed my receiver project, the overall performance was better than expected. In particular, the oscillator stability was found to be good, although I'd anticipated it being quite a problem.

Considering that there are three oscillators

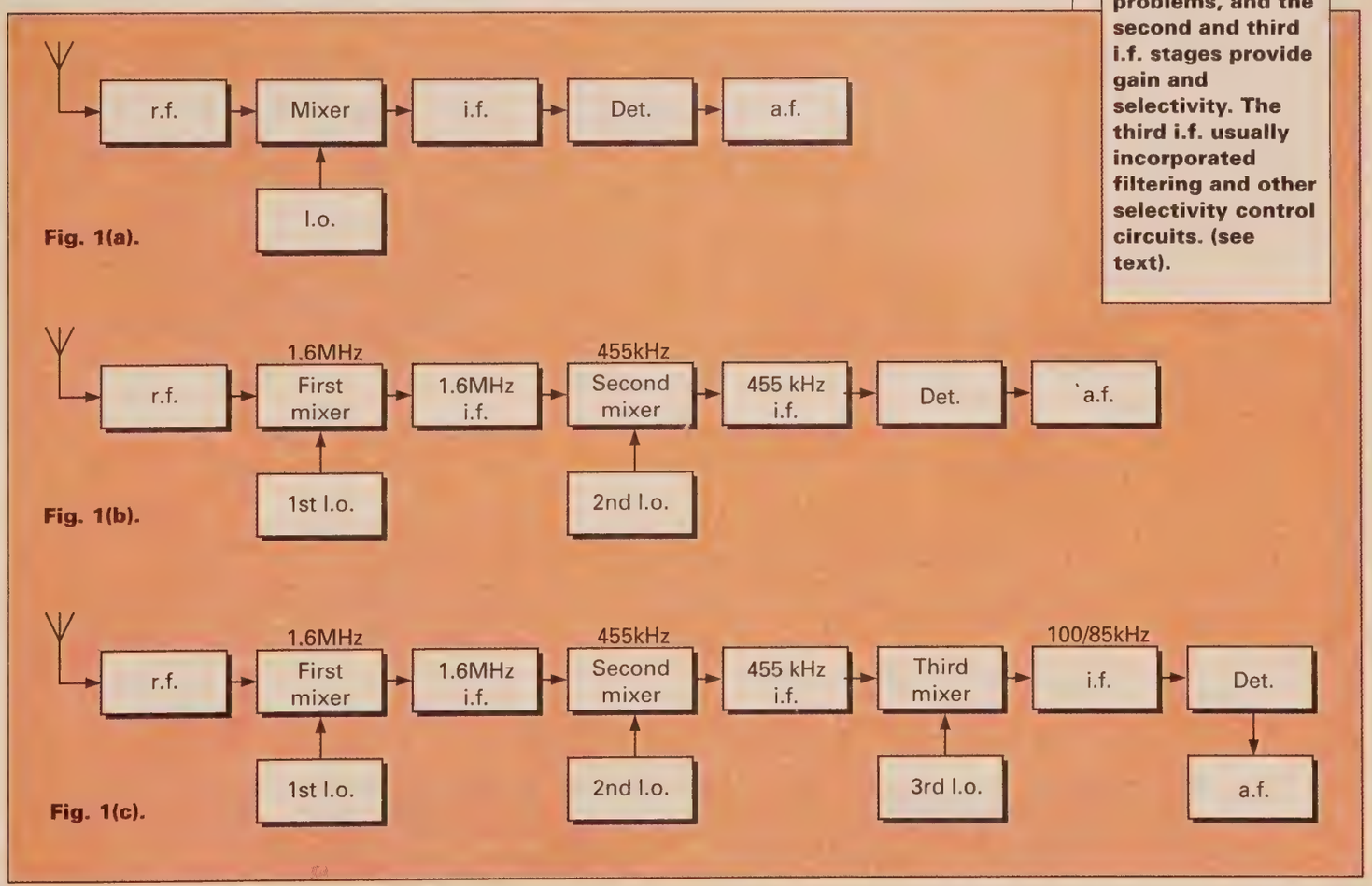


Fig. 1: (a) Block diagram of a single-conversion superhet receiver. To reduce image i.f. signal problems, it is common practice to have a high first i.f. frequency. Some receivers use a first i.f. of 5, 9MHz or even higher.
(b) Block diagram of a typical dual-conversion superhet, employing a first i.f. of 1.6MHz and a second i.f. of 455kHz (some manufacturers, typically Eddystone radio, used 85kHz as the second i.f.). The receiver design chosen by G3SIH used this approach in conjunction with a tuneable (1.6MHz) i.f.
(c) A triple-conversion superhet shown in block diagram form. The higher frequency first i.f. reduces image problems, and the second and third i.f. stages provide gain and selectivity. The third i.f. usually incorporated filtering and other selectivity control circuits. (see text).

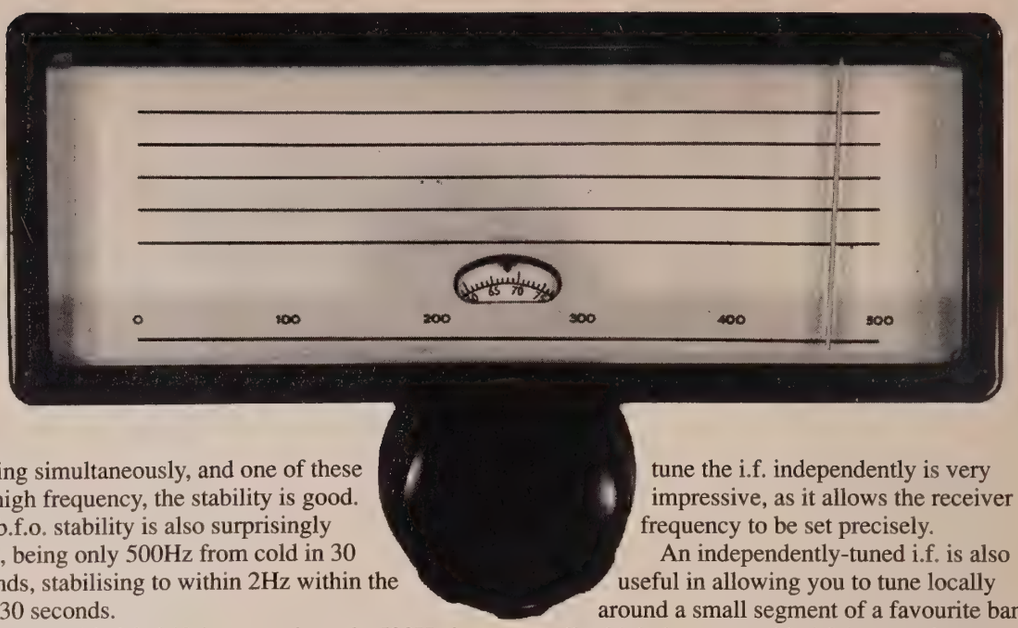


Fig. 2: An Eddystone 898 dial assembly, measuring 90 x 230mm, is suitable for larger projects. Although they are no longer manufactured, 898 dials can be recovered (as this example was) from older home-constructed equipment and provide an excellent finish to a receiver. This type of tuning mechanism can be used with an l.c.d. frequency counter display, providing the operator with the advantages of analogue and digital frequency control.

running simultaneously, and one of these at a high frequency, the stability is good. The b.f.o. stability is also surprisingly good, being only 500Hz from cold in 30 seconds, stabilising to within 2Hz within the next 30 seconds.

The tuneable i.f. drift is approximately 500Hz in the first 30 seconds from switch-on, stabilising to within 2Hz during the next 60 seconds. It's possible to listen to broadcast stations around 1.5MHz on zero beat for some very considerable periods of time.

With the completed project switched to 5MHz, it suffered oscillator drift of only 1.7kHz during a period of 20 minutes. Thereafter, it stabilised to within 200Hz. At 2MHz, stability is achieved within 20Hz after one minute following switch-on.

So, you can realise from what I've reported, that it pays to spend time on the receiver front-end. The reward is given in stability, and I've no doubt that much of the stability is obtained by using the separate front-end boards for each band.

Extremely Effective

As I've already mentioned, in operation, the T-notch filter is extremely effective. The filter I've incorporated in my design, can be tuned over a frequency span of ±5kHz about the mean frequency of 455kHz.

The notch is capable of reducing the marker signals at 5MHz to almost inaudible levels. The notch filter will also reduce the most persistent interfering heterodyne, to an exceptionally low level.

From my tests, it would appear that the notch depth obtained with the filter, is 50dB and possibly more. I've estimated the notch width at 1.5 to 2kHz, so you'll realise that I recommend fitting a *Q*-multiplier even though there's a slight insertion loss.

The noise blanker has proved effective on impulse type noise, and the 'woodpecker' type of noise. The blanker in effect, silences the receiver for the duration of the pulse.

The blanker type of filter is fine for the well-spaced type of impulse interference like lightning discharge. But if the pulses are closer together, say every 250ms (milliseconds), the blanking gives the impression of being continuous. So, although the blanker has its uses, generally speaking, I don't use it that much.

Operation Of Receiver

I found that with my project, the operation of the receiver itself, was best carried out with the tuneable i.f. set to 1.6MHz. I then carry out the tuning using the main dial.

In practice, with the approach I've adopted, tuning the receiver is straightforward. The ability to tune the i.f. independently is very impressive, as it allows the receiver frequency to be set precisely.

An independently-tuned i.f. is also useful in allowing you to tune locally around a small segment of a favourite band. I really think that a tuneable i.f. is a good system, and recommend other designers to adopt the idea.

Image And Other Signals

As with all designs, there are image and un-wanted signals. However, I have found that problems like this can be effectively reduced by using an antenna designed for the frequency in use.

The tuned antenna will assist the receiver, by discriminating against signals falling outside of its resonant frequency. Sometimes, it's possible to virtually eliminate an un-wanted signal by simply switching from one fixed antenna to another.

The fixed antenna method is particularly effective when using amateur band dipoles for general listening over the 3 to 30MHz band. It's especially effective if the antenna orientation varies from dipole to dipole.

Antenna Tuning Unit

The next important item ahead of the receiver, is the antenna tuning unit (a.t.u.). The a.t.u. enables the antenna to be matched to the receiver, and aids the selectivity of the system as a whole, by discriminating against off-frequency signals.

When it comes to choosing an a.t.u., there is a very wide choice. It's up to the individual as to what circuit to use, but I think that the band-pass type of tuner is probably the best for the job.

Tuned Preselector

Another item that can be used with a receiver, is a tuned pre-selector. I use a double-tuned circuit, and it offers enough rejection to a 15MHz image, with a receiver tuned to 12MHz to permit normal listening.

My preselector (there are many other suitable published circuits) is currently under development. It is continuously tuneable from 1.7 to 30MHz, using varicap diodes.

The unit can be left tuned to the centre of the required band. Peaking is only carried out when the desired station or frequency is found. As I had some of the old Denco coils, I used these, but there's nothing to stop you using others, including toroidal types.

Temptation Arises

The trouble with home construction is that as soon as the finalised project is started, the

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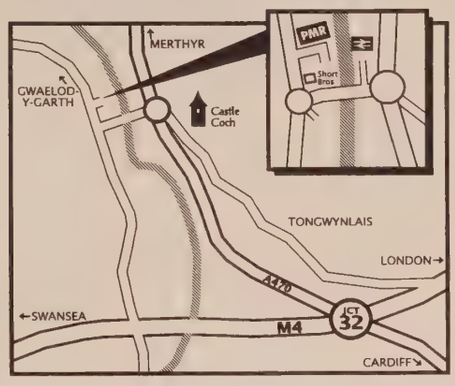

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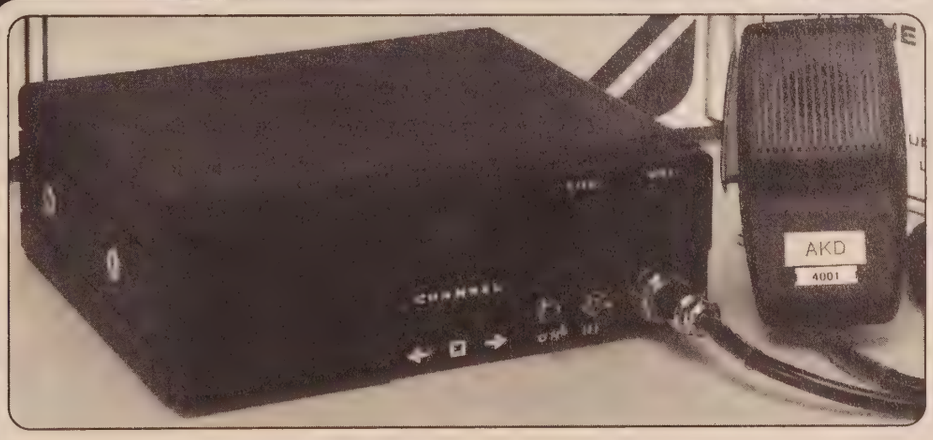

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temptation to modify the job arises. My receiver was no exception to this problem!

The modifications I've ended up with include:

1: Extra input terminals to the tuneable i.f., enabling the i.f. to be used as a receiver in its own right, with the r.f. front-end being turned off by an otherwise spare section of the band-change switch.

2: The 455kHz i.f. input can be terminated on the front panel, in order to enable the receiver to be used as an i.f./a.f. strip.

3: Both crystal markers can be terminated on the rear apron, together with the input to the a.f. amplifier, together with the 9 and 12V d.c. supply lines.

All these modifications and additional features will be very helpful especially when I'm testing ancillary home-constructed equipment.

In Retrospect

In retrospect, if I were to build my receiver again (what a thought!), I would build the project with some modifications. The main modification would certainly involve the main front-end.

To help prevent oscillator pulling, I would build the r.f. front-end physically larger. Each section would be completely screened in its own metal enclosure, and the separate screened enclosures would then be supplied via feed-through capacitors.

Additionally, I think that I would also do away with three-gang tuning capacitors, and opt for varicap tuning diodes. This would bring the tuning directly onto the p.c.b. associated with each band, improving stability even more.

Digital read-out on the tuning would almost certainly be incorporated, if I attempted another receiver of this type. It's a virtual necessity in any case, as the tuning potentiometer rotates through approximately 300°. Despite this, with some careful selection of the resistors controlling varicap voltages, it is possible to obtain the necessary tuning range over just 180°.

Another very worthwhile improvement, could be the restriction of the tuneable i.f. tuning range. This can be reduced to 1.66MHz ±50kHz, providing a total tuning span of 100kHz, instead of the original 400kHz. With this modification, a receiver could provide dial calibration to within 1kHz.

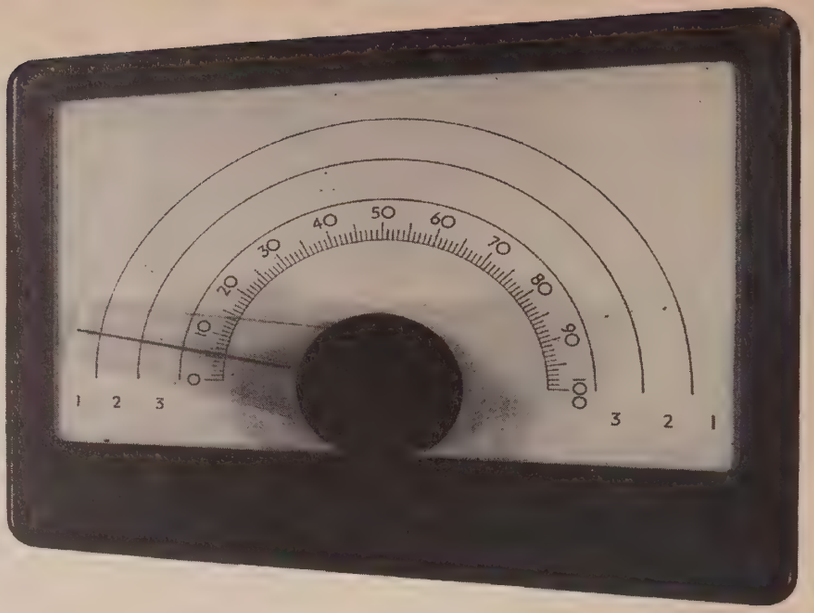

Fig. 3: Smaller dial mechanisms, such as the Jackson epicyclic reduction type shown here, provide a neat appearance together with useful slow-motion fine tuning control. This type of dial, measuring 90 x 120mm, is particularly suitable for smaller portable equipment incorporates a 6:1 slow-motion drive.

Other Filters

I've also had other thoughts regarding filters. The incorporation of two T-notch filters in-series is a particularly interesting idea.

The addition of an audio notch filter instead of the i.f. filter could be an alternative. Various 455kHz i.f. filters can also be fitted. They can be switched in and out as required, to cover the band-widths from (for example) 500Hz to 16kHz.

PW

Story So Far

Well, that's the story so far, and what an interesting experience it was! I've built many projects before the one that provided the ideas for this article, but this particular receiver was by far the most complex.

The final result was a receiver that works well, is a pleasure to use and can be easily modified. The very fact that every part of the receiver was familiar to me, was a valuable asset, providing extra encouragement towards further 'fine tuning'.

There are aspects of the receiver that can be improved, but that's the fun of home construction, as there's always something to think about. So, why don't you have a go at your own pet project?

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Making A Valved Active Antenna

As PW *has a receiving them this month, Adrian Knott G6KSN, looks at an old idea, for solving a very modern problem. Adrian's active antenna should prove useful and interesting, even if you're not into valve work.*

This receiving project uses a valve working with only 12V h.t. If you suffer from local TV timebase interference or computer hash, then it's worth a try. The project covers the frequency range 1 to 10MHz (30MHz with reduced gain).

The letters page in *PW* gave me a strong hint that quite a few radio enthusiasts are interested in valved circuits. However, the main difficulty seems to be with the high voltage supplies required.

The heater requirements, typically 6.3V at 0.3A, are a bit wasteful. But if the equipment is operated from mains or from a car battery, then it doesn't matter too much.

A surprising number of valves can be used at low h.t. voltages. Circuits such as audio oscillators and add-on b.f.o.s can often work with only a 12V anode supply.

Some years ago there were car radios using 12V h.t valves. I've recently become quite interested in applications where 12V serves as both the low tension or l.t. heater supply and the high tension h.t. anode supply.

This little circuit uses the low voltage technique. Although it is not so good on the higher h.f bands, it's useful on 1.8, 3.5, and the 7MHz amateur bands and up to the 9MHz broadcast band.

Simple Concept

You might be wondering what an active antenna is, and I have to admit that the term may mystify the uninitiated. Actually it's a very simple concept, so let's take a look at the circuit, in **Fig. 1**.

In practice, an 'active antenna' is a small antenna followed by an amplifier. Despite this, the active antenna does have some special properties, although there are pitfalls in its design. But they have something to offer the amateur (even those with large gardens).

First of all, we'll look at the 'small antenna'. And, for our purposes, I'll suppose this is a vertical whip 1m long. A whip antenna of this size will have sufficient pick-up at h.f., to have approximately 1µV of background noise at the base.

Most receivers can operate with an input of around 1µV, so there is no point using a larger receiving antenna. Or is there?

The main problem, is one of mismatch between the whip antenna and the receiver. The whip is roughly equivalent to a small capacitor of, let's say, 10pF.

At 1MHz this represents a high impedance (or reactance) of about 16kΩ. If it's connected directly to a receiver having a 50Ω input impedance, most of the signal will be lost.

What's needed next, is some sort of matching device which will keep the 1µV delivered by the antenna, and deliver it to 50Ω receiver input socket. This can be done using an amplifier having a very high input impedance, and low output impedance.

In the world of valves, the traditional circuit to match a high to a low impedance is called a cathode follower. Nowadays, it has a modern equivalent, in the emitter follower with bipolar transistors, and the source follower when f.e.t.s. are used.

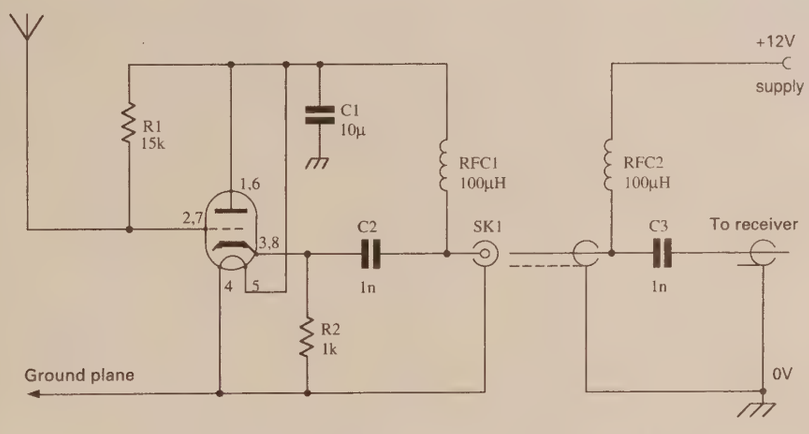
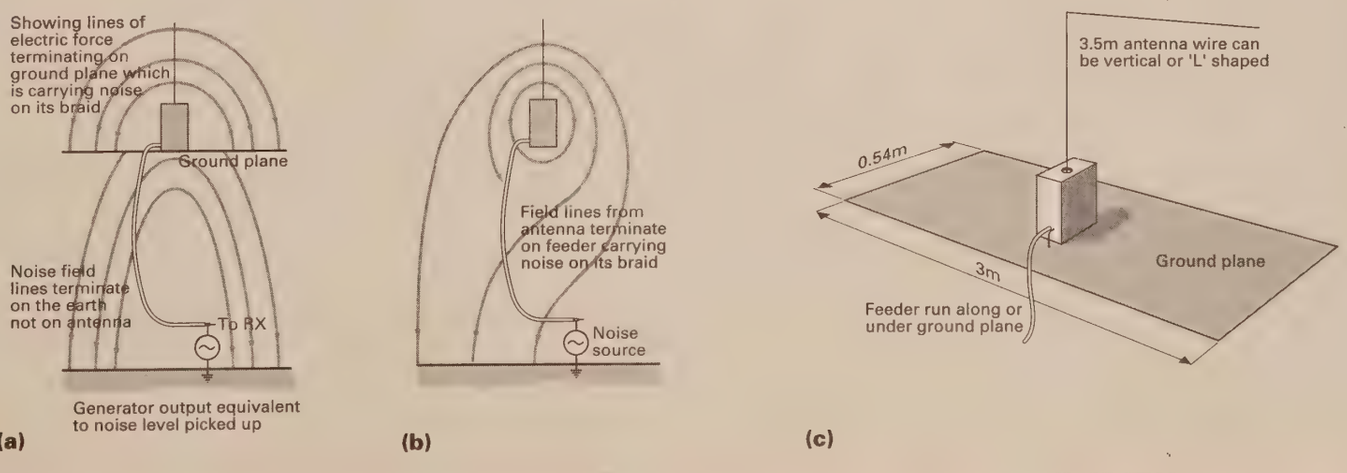


Fig. 1: Circuit of the valved active antenna, with the valve diagram and pin-out numbering shown in Fig. 4. The power supply insertion unit circuit is also shown (see text).

Fig. 2 (a,b and c) below: Diagrams illustrating screening effect of a ground plane, and why the coaxial cable needs to be screened from the active antenna. The author's practical, and proven ground plane is also shown with working dimensions (see text).


Showing lines of electric force terminating on ground plane which is carrying noise on its braid
Ground plane
Noise field lines terminate on the earth not on antenna
To RX
Generator output equivalent to noise level picked up
(a)
Field lines from antenna terminate on feeder carrying noise on its braid
Noise source
(b)
3.5m antenna wire can be vertical or 'L' shaped
0.54m
3m
Ground plane
Feeder run along or under ground plane
(c)

Eliminate Interference

By using a small whip antenna mounted well away from TV sets, dimmer switches, vacuum cleaners, computers etc., it's possible to eliminate much of the interference heard on the lower h.f. bands. The reduction can be dramatic.

It's most unusual to find a quiet 3.5MHz band at most amateur stations. This is because the large antenna used for transmitting, picks up all interference sources in the locality.

Additionally, the average antenna provides far more pick-up than a modern receiver needs. Once the atmospheric noise is audible, there's no point using a large antenna, as both noise and wanted signal increase together.

The active antenna, on the other hand, is physically small and in use is placed well away form interfering devices. In practice, this form of antenna is only just large enough so that atmospheric noise is audible. This level of input leaves the receiver lots of overload margin for stronger signals.

Problem Feeder

There is one particular problem in the design of active antennas. It's that the feeder itself will pick up far more signal than the whip antenna itself, along with lots of interference.

The main unwanted pick-up of signals, tends to happen on the outer braid of the coaxial cable. So, because of this, it's necessary to avoid the feeder introducing signals into the whip.

Reducing the problem from the feeder, is done by providing a good ground plane made of wire netting or cooking foil. The diagram, **Fig. 2**, shows how to avoid the whip 'seeing' the feeder.

In engineering terms, we can say that the electric field lines from the whip antenna, must terminate on the ground plane and not the feeder. You may ask, why not use a dipole as the small pick-up antenna?

The difficulty of using a dipole, is that to avoid the interference on the feeder getting into the antenna, there would need to be perfect balance. Unfortunately, it's simply not possible to achieve the necessary degree of balance.

I'll suggest an example and say it was specified that an interference level of 1mV on the feeder, should only gives 1µV on the antenna. In practice, this requires 60dB of rejection, which is very hard to achieve.

At the higher end of the h.f. range, there are less advantages in using an active antenna. This is because the atmospheric noise level is lower.

So, at the higher h.f. frequencies, the amplifier could, with advantage, have a little more gain. Because of this, I would recommend the present design more for the lower frequency bands.

Small Box

The amplifier is built into a small metal box, large enough to accommodate the few components. The valve holder is mounted on a metal plate fitted across the box, although any type of construction will do.

The output connector is fitted to the lower side of the box, and the antenna wire is brought out through a large hole in the top. It's very important to a avoid capacitance between the antenna wire and earth, as this shunts the signal. I used a ceramic insulator at this point, but it's not really necessary.

The pin connections to the valve are shown in the inset, on the circuit diagram, **Fig. 1**. These are numbered looking from **below** the valve in a clockwise direction starting from the gap. This is opposite to modern i.c. pin-out numbering.

Suitable Valves

There are many suitable valves for this project. I used a 12AT7 (also called ECC81). This easily obtainable valve contains two triodes, in a single glass envelope.

To improve the performance, I connected the

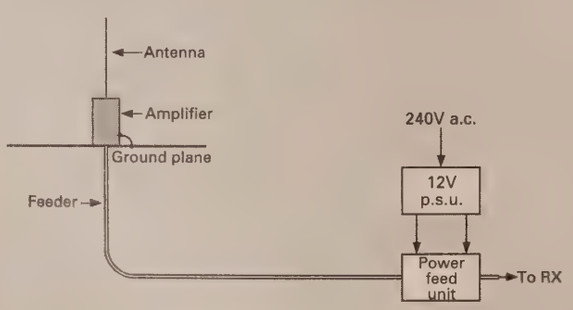
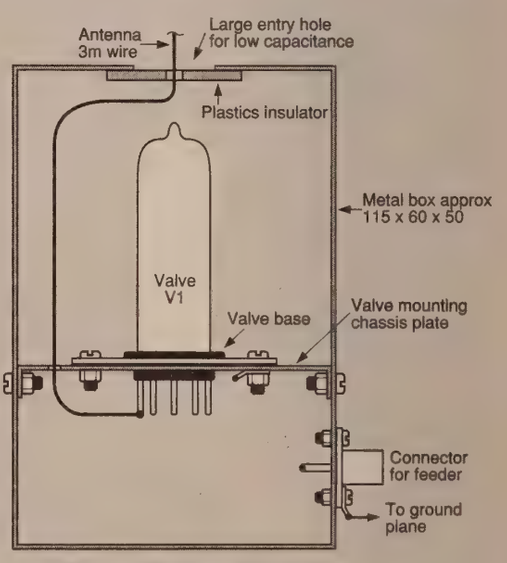


Fig. 3: Illustration showing complete system. The combined 12V h.t./l.t. power supply is fed to the amplifier from the power feed unit (circuit shown as inset in Fig. 1). See text for details on winding the low resistance r.f.c.



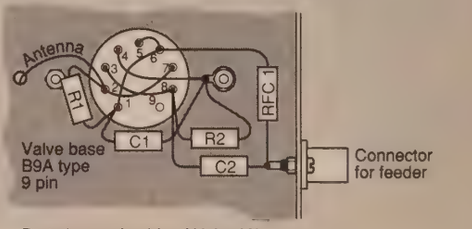


Fig. 4: Diagram showing the advised method of mounting the amplifier in the metal box. For outdoor use, suitable waterproofing precautions must be taken to avoid loss of efficiency and damage to the components.

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The TS-950SDX is at the very pinnacle of the Kenwood HF transceiver range. And when you look at its specification, that's not surprising.

It boasts a number of highly advanced features like built-in Digital Signal Processing, 50 Volt MOSFET finals, AIP (advanced intercept point), built-in sub-receiver and built-in automatic antenna tuner. To name but some of its world-leading technical tours-de-force.

Just as important, it's made with Kenwood's traditional attention to detail and reliability, to stand up to a lifetime's use. A fact which your Kenwood dealer will be proud to demonstrate when you visit for a closer look at this world-leading transceiver.

The TS-950SDX is part of a range of Kenwood HF transceivers priced from around £1000 to £3500. And although quality is never cheap, it's still a small price to pay to have the world of amateur radio at your command.

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valves in parallel. However, the two heaters, which require 6.3V each, were connected in series to operate from a 12V supply.

The antenna itself is 3m of wire, which in my case, is tied to the rafters as an inverted 'L'. You can support the antenna vertically if you wish, by using a wooden pole or bamboo.

My ground plane was made from a roll of aluminium cooking foil measuring 3m by about 0.5m wide. This is ideal for loft installation. If the system is to be used outdoors, either a similarly sized piece of wire netting or a few wire radials would be more suitable.

Don't forget that the idea of the ground plane, is to screen the antenna from the feeder. So, if you're using the antenna outdoors, run the feeder along or under the ground in the vicinity of the active antenna itself.

The d.c. power is fed up the feeder to the amplifier, using r.f. chokes to separate it from the signal. This is the same technique used in masthead amplifiers, employed in TV applications.

As the consumption is about 300mA, it's necessary to keep the resistance of the chokes below about 3Ω total, to avoid an excessive voltage drop. However, this was more or less achieved with the prototype without any special precautions from me!

Testing And Warm-up

When you're testing, don't forget that valves take some time to warm up. It's easy to be misled, and most TV producers forget this fact when they're producing wartime plays, and their radio warms up in about two seconds!

As the valve reaches its operating temperature, signal levels will suddenly rise. You should find the bands sounding quite clean, with a little hash from TV sets.

Signals will be much weaker than those received when a full-sized wire dipole is used. Despite this, the signal-to-noise ratio of signals will be better.

Don't be misled by the effects of the automatic gain control (a.g.c.) when assessing results, as it tends to raise noise in-between words. My own impression was that 7MHz sounded more like 14MHz, and listening was much more pleasurable.

Intermodulation

Active antennas are often accused of causing intermodulation when there are strong signals. However, this valve circuit is difficult to overload itself, and does not have enough gain to overload the receiver. Normally, it's the receiver mixer which is the vulnerable item, and it is important not to use too much gain ahead of this stage.

It's worth mentioning that arrays of active antennas can be built. For instance, a 2-element array could be made by using two active antennas spaced a quarter of a wavelength apart. Such an array has virtually no coupling between the antennas to complicate matters.

Closer spacings, other than quarter wavelengths, can also be used. But, if you do try closer spacings, there will be a reduction in signal which may not be tolerable.

Fun Project

I've presented this valved active antenna as a fun project. It's very easy and interesting. If you want to try a solid state version, then by all means go ahead, but I suggest you use a f.e.t.

If you're thinking of purchasing an active antenna, be most careful over the specifications. This is because normally simple statements like 'gain' and 'noise factor', need careful definition when the amplifier is intended for this unusual application where the source is a very high impedance.

Have fun with your valved active antenna. It's virtually 'bomb-proof' and great fun to build and use.

PW

How Difficult? Beginner

How Much? Approximately £10 (depending on spares box)

Shopping List

Resistors

Metal film 0.6W type.

1kΩ	1	R2
15kΩ	1	R1

Capacitors

High voltage disc ceramic

1nF	2	C2, 3
10nF	1	C1

Inductors

Radio frequency choke	2	RFC1, 2 100µH (max resistance 1.5Ω)
Valve ECC81/12AT7	1	V1 (see text)

Miscellaneous

Valveholder (B9A), suitable aluminium box (die-cast with rubber seals for outdoor use), coaxial cable plugs and sockets, self-amalgamating tape (for sealing purposes). The inductors, L1 and L2, can be made up by winding 40 turns of thin connecting wire over a suitable length of ferrite rod. Virtually any resistors will do for the circuit, and Maplin 0.6W metal film types are suitable. High voltage disc ceramic capacitors (Maplin JLO3D and JLO4E are suitable).

Valves and Valveholders are available from: Colomor (Electronics) Ltd., 170 Goldhawk Road, London W12 8HJ. Tel: 081-749 3934.
J. Birkett, 25 The Strait, Lincoln LN2 1JF. Tel: (0522) 520767.
RST Mail Order Co., (Langrex Supplies Ltd.) 1 Mayo Road, Croydon, Surrey CR0 2QP. Tel: 081-684 1166.

KENWOOD APPROVED DEALERS

AXMINSTER
Reg Ward & Co, 1 Western Parade, West Street, Axminster, Devon.
Tel: 0297 34918

BELFAST
GM Electronics, 1-3 Evelyn Avenue, Belfast, Northern Ireland.
Tel: 0232 471295

BIRMINGHAM
South Midlands Communications, 504 Alum Rock Road, Alum Rock, Birmingham. Tel: 021 327 1497

BIRMINGHAM
Ward Electronics, 422 Bromford Lane, Ward End, Birmingham.
Tel: 021 328 6070

BOURNEMOUTH
Lowe Electronics, 27 Gillam Road, Northbourne, Bournemouth.
Tel: 0202 577760

BRISTOL
Lowe Electronics, 79 Gloucester Road, Patchway, Bristol. Tel: 0272 771770

BRISTOL
AMDAT, 4 Northville Road, Northville Bristol. Tel: 0272 699352

CAMBRIDGE
Lowe Electronics, 162 High Street, Chesterton, Cambridge.
Tel: 0223 311230

CARDIFF
PMR Ltd, Industrial Estate, Gwaelod-y-Garth, Cardiff. Tel: 0222 810999

CLACTON ON SEA
Coastal Communications, 19 Cambridge Road, Clacton on Sea, Essex.
Tel: 0255 474292

CORK
Intronic Ltd, Windsor Hall, Glounthaune, Cork, Eire.
Tel: 010 353 2135 4422

COUNTY TYRONE
Tyrone Amateur Electronics, 44 High Street, Omagh, Co Tyrone, Northern Ireland. Tel: 0662 242043

CUMBERNAULD
Lowe Electronics, Cumbernauld Airport Cumbernauld. Tel: 0236 721004

DONCASTER
Alan Hooker, 42 Nether Hall Road, Doncaster, South Yorkshire.
Tel: 0302 325690

EALING
Martin Lynch, 286 Northfield Avenue Ealing, London. Tel: 081 566 1120

EASTCOTE
Lowe Electronics, 223 Field End Road, Eastcote, Middx. Tel: 081 429 3256

EDGWARE
Haydon Communications, 132 High Street, Edgware, Middx.
Tel: 081 951 5782

FIFE
Jaycee Electronics, 20 Woodside Way Glenrothes, Fife. Tel: 0592 756962

HANGER LANE
A R E, 6 Royal Parade, Hanger Lane, London. Tel: 081 997 4476

HAYWARDS HEATH
Bredhurst Electronics, High Street, Handcross, Haywards Heath, West Sussex. Tel: 0444 400786

HOCKLEY
Waters & Stanton Electronics, Spa House, 22 Main Road, Hockley, Essex
Tel: 0702 206835

LEEDS
South Midlands Communications, Nowell Lane Ind Est, Nowell Lane, Leeds. Tel: 0532 350606

LEEDS
Lowe Electronics, 34 New Briggate, Leeds. Tel: 0532 452657

MAIDSTONE
Lowe Electronics, Chatham Road, Sandling, Maidstone. Tel: 0622 692773

MATLOCK
Lowe Electronics, Chesterfield Road, Matlock, Derbyshire. Tel: 0629 580800

NEWCASTLE
Lowe Electronics, Newcastle Airport, Woolsington, Newcastle.
Tel: 0661 860418

NEWPORT PAGNELL
Photo Acoustics Ltd, 58 High Street, Newport Pagnell, Bucks.
Tel: 0908 610625

NEWTON LE WILLOWS
Amateur Radio Comms Ltd, 38 Bridge Street, Earlestown, Newton Le Willows Merseyside. Tel: 0925 229881

NORFOLK
Eastern Communications, Cavendish House, Happisburgh, Norfolk.
Tel: 0692 650077

NORTH HUMBERSIDE
Peter Rodmell Communications, Field Head House, Leconfield, North Humberside. Tel: 0964 550921

NOTTINGHAM
R A S Nottingham, 3 Farndon Green, Wollaton Park, Nottingham.
Tel: 0602 280267

PORTSMOUTH
Nevada, 189 London Road, Portsmouth Hants. Tel: 0705 662145

SLOUGH
Lowe Electronics, London Heathrow, 6 Cherwell Close, Langley, Slough, Berks. Tel: 0753 545255

STOURBRIDGE
Dewsbury Electronics, 176 Lower High Street, Stourbridge, West Midlands
Tel: 0384 390063

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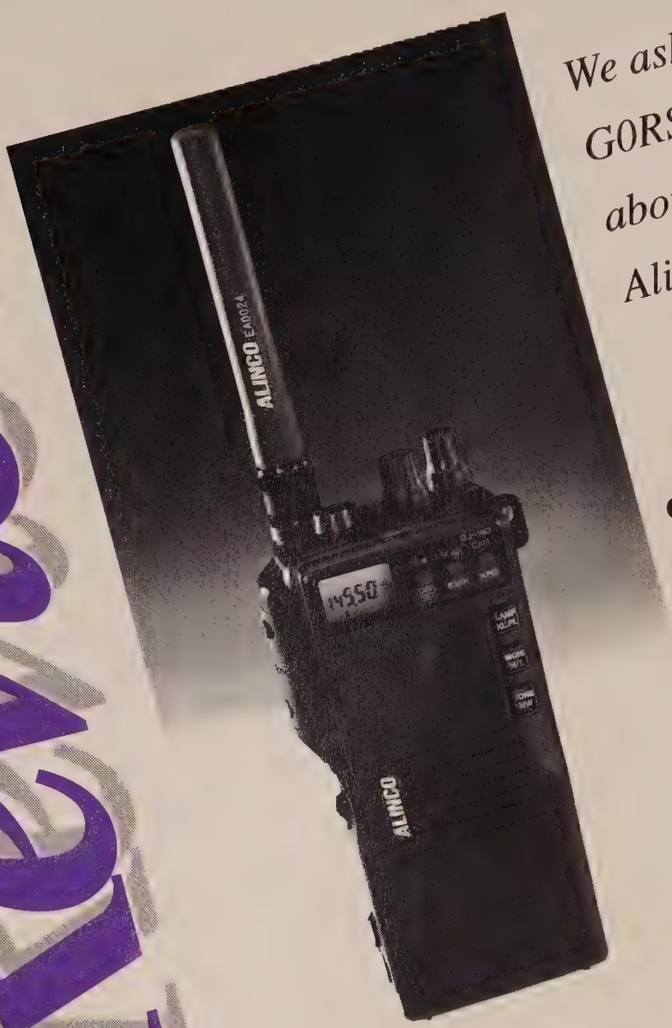
Review

We asked Richard Newton G0RSN, to tell us his thoughts about the new mid-priced Alinco hand-held transceiver.



The Alinco DJ-180EB is one of the latest easy-to-use, mid-range hand-held transceivers that are coming onto the market. Aimed firmly at the new user, or as a second set, the DJ-180 is very competitively priced. So what do you get for your money?

The Alinco DJ-180EB comes with a very neat and professional package. The radio itself is finished in a smart matt grey metal and plastic case. It comes with a belt clip, carry strap, helical antenna, a smart 'sit in' style charger and a 7.2V 700mAh NiCad battery pack. It also comes with a 23-page instruction leaflet including a schematic diagram.

Good Judge

My father told me that a handshake was a very good way to judge character, a yardstick I've always remembered and used with success. A yardstick, the DJ-180EB passed with flying colours.

It is a lovely radio to hold, being compact but not so small that controls and readouts become lost. It is small enough to fit in a pocket or small handbag, but has the feel of being substantial. This feel gives you the confidence that it will do its job, and do it well.

The radio has simple and clearly labelled controls. No matter whether you are left or right-handed, the essential controls fall naturally at your fingertips.

On Charge

As I was eager to find out what the DJ-180 could do, I put it on charge, which takes 12 to 14 hours. I used this period to have a look at the manual. The supplied battery pack, gives 2W output on high power. Low power is a mystery however, for nowhere could I find any mention of what the output is on this setting. I presume it was about 500mW.*

Now with a fully charged battery, off I went pedestrian mobile, immediately working two stations in a local contest. I received very favourable reports from both stations, the most distant being about 15km away as the crow flies.

From my location on the outskirts of Bournemouth, I could access the local repeater with ease on low power. I could also hear the repeaters at Wells in Somerset, and Portsmouth in Hampshire. Although I was unable to access them, I was most impressed with the sensitivity of the little radio.

Good Value

The DJ-180 strikes me as good value for money. It has basic, down to earth controls and functions. It doesn't waste time or space with gadgets or 'gismos'.

On the top panel is a BNC antenna connector, external microphone and speaker sockets. The controls consist of a low profile, but easy to use variable squelch control, a good sized on/off/volume control knob and a matching rotary type frequency control.

The PTT, toneburst and function switches are located on the side of the radio. They are in the form of rubber membrane covered switches.

On the front of the transceiver is an l.c.d. frequency display, which can be read at virtually any angle. However, some readers may find the smaller function symbols a little difficult to see.

There are also push buttons to control v.f.o./memory operation, scanning, call frequency, lamp, monitor and tone. Each button has a second function. The buttons and their second functions are well labelled and are easy to use.

The DJ-180 has a variable off-set frequency function, and this can be set up to ±15.995MHz. The offset, along with the main frequency, can be set in steps of, 5, 10, 12.5>15>20 and 25kHz.

* See specifications for *PW* tests.

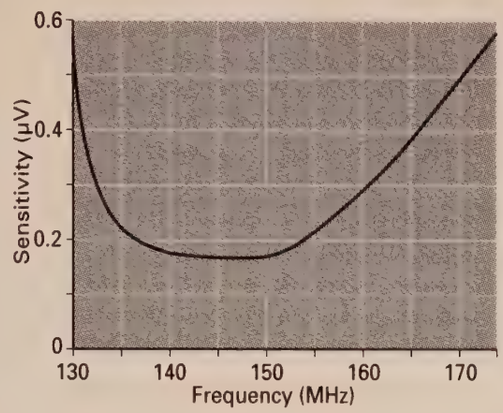


Fig. 1: *Practical Wireless* workshop tests. The measured receiver sensitivity seemed to live up to the quoted figure. Although, for technical reasons at these sensitivity levels, measurements are very difficult to quote accurately.

There are 10 memories for use. Pressing the call button recalls the information in memory 0. On scan, the radio will either scan the whole v.f.o. range or the 10 memories, stopping for about five seconds on a busy signal before resuming.

Another feature I found to be useful was the auto power-off facility, a must for all those as forgetful as I am! The lamp is, I think, marvellous. It back-lights the display very well indeed for five seconds and then turns off. It will remain on for as long as the buttons are being used.

There's another useful feature too. For quick tuning you can depress the function button and turn the frequency control to move up and down the v.f.o. range in 1MHz steps.

Power Socket

I must admit to have been slightly disappointed with some of the aspects of the DJ-180. It would, for example, have been useful to be able to set up a lower and upper limit for the v.f.o. scan, and to my utter dismay there is no external power socket.

The lack of an external power socket I must admit did surprise me, even when considering this to be a budget radio. A d.c. power adaptor is, however one of a very comprehensive list of optional extras that are available. The list of add-ons, also includes DTMF (dual tone multi frequency) and a 50 or 100 channel memory pack.

More Versatile

Due to information I found in the packing, I turned the DJ-180 on while holding down two specific buttons, and to my amazement, the radio no longer covered 144 to 145.995MHz, but became fully operational from 130 to 173MHz inclusive.

The wide-band reception can be just as easily reversed. The only disadvantage of a very wide-band coverage, is that the v.f.o. scan now becomes an arduous task. In my opinion though, the benefits outweigh that slight inconvenience.

Summing Up

On the whole and summing up, I think that the DJ-180ED is a smart and professional looking package. The radio is compact, being about the size of a regular pack of playing cards, and its controls are easy to use and well set out. I constantly got good audio reports, and I cannot fault the receiver sensitivity. With its extended coverage and supplied accessories costing only £189.85, I believe it to be excellent value for money.

What more can I say, I was sorry to have to have to hand it back.

My thanks go to, Waters & Stanton, of 22 Main Road, Hockley, Essex SS5 4QS. Tel: (0702) 206835 or 204965 for the loan of the review model. The Alinco DJ-180EB is available with antenna and a.c. charger supply for £189.85 plus p&p. **PW**

Manufacturer's Specification

Measured Values, where they differ, are shown in brackets.

General	
Frequency coverage	130-174MHz (receive) 144-145.995MHz
Transmits	5, 10, 12,5, 15, 20, 25KHz
Step rate	10
Memories	50Ω
Antenna impedance	F3E(f.m.)
Modulation	5.5-13.8V
Voltage range	132 x 58 x 33
Dimensions	approximately 350gms
Weight	
Transmitter	
Output Power	High 5W at 13.8V 2W at 7.2V (1.8W) Low (290mW at 13.8V) (250mW at 7.2V battery)
Deviation	±5HkHz maximum, (3.8kHz)
Receiver	
Double conversion	21.4MHz
1st i.f.	455kHz
2nd i.f.	
Sensitivity	Better than -16dBµV or 0.16µV (see Fig. 1)

A Tuned CW Filter

Ben Nock G4BXD, shows you a tuned active filter to make Morse on the crowded h.f. bands easier to understand.

I'm sure many more operators would use Morse if it weren't for reception problems on crowded h.f. bands. Trying to copy one varying Morse signal among the scream and howl of other signals is not the easiest of things to do.

Morse is a super mode, given a good filter, either crystal - in the i.f.- or in the audio stages. A crystal filter can cost anything between £50 - £60, so a cheaper alternative was sought.

Cheaper Option

I decided that an audio filter, based around a 'tuned' amplifier would be a much cheaper option. After buying the coil and the integrated circuits, and assuming a good junk-box, the cost of this audio filter should be around £6. I also decided to use an LC tuned input circuit, and a broadly tuned filter stage, rather than the more usual complete frequency modelled one.

I reasoned that the simplicity and sharpness of an LC tuned circuit would be easier to design and build. The broadly tuned amplifier stage is, in reality, a combined low-pass and high-pass filter, which gives a peak in its response curve.

The Circuit

The circuit diagram, **Fig. 1**, shows details of the complete c.w. filter. The project comprises an LC tuned circuit (L1/C1) an amplifier with frequency modelling (IC1), and a low-pass filter (R6/C5). An LM380 audio amplifier (IC2) completes the circuit.

Capacitor C1 is calculated to resonate with L1 at 800Hz, and the value should be made up from several smaller capacitors. If you use a 330mH coil for L1, then C1 must be changed to 120nF, which is an easier combination to achieve. I just happened to have a 350mH coil, so I chose C1 to suit.

In the low-pass filter combination of R6/C5, capacitor C5 is also chosen to suit, and its value should be made up from a variety of smaller values.

The input to the circuit is taken from the loudspeaker or headphone socket of a receiver. The audio output is then taken to a loudspeaker or low impedance headphones.

Tuned Circuit

The tuned circuit, consisting of L1 and C1, is centred (resonated) on 800Hz. This 800Hz frequency is considered 'the normal' offset used when receiving c.w.

The centre frequency can be set to almost anything, and by using a pre-wound coil (of 350mH) the resonating capacitor can be found from the formula:

$$f = \frac{1}{2\sqrt{L1C1}}$$

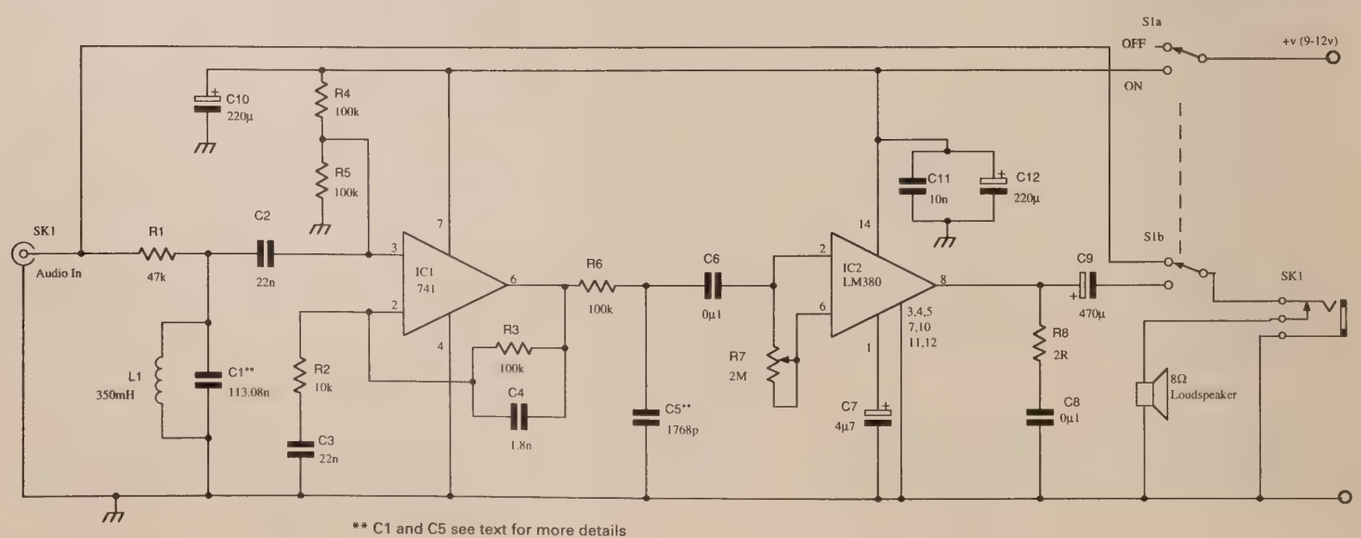
From my calculations, the capacitor C1 has to be 113.08nF for a frequency of 800Hz. The actual capacitance will probably be slightly less, due to stray capacitance in the wiring. The capacitance will need to be made up of several capacitors in parallel to make up the odd value. For more accurate work, an oscilloscope and signal generator are useful for setting up the peak response.

Tuned Amplifier

The tuned amplifier stage is based on the 741, or similar type, integrated circuit, operating from a single supply rail. The non-inverting input is held at half the supply voltage, created by the resistor pair R4/5. There are two frequency sensitive combinations in the overall negative feed-back loop.

The combination of C3 in series with R2 sets the lower frequency point, and C4 in parallel with R3 sets the upper frequency. The two frequencies are called the upper, and lower, cut-off points. They are not absolute cut-off points, but are frequencies at which the gain of the stage starts to vary. These are where the gain of the stage has fallen by 3dB (down to half power).

The two frequencies are arranged to be either side of the 800Hz centre frequency of the tuned circuit (or whatever centre frequency you choose). The values quoted give cut-off points of about 720 and 880Hz.



** C1 and C5 see text for more details

Fig. 1: The circuit diagram of the 800Hz c.w. filter.

Low Pass Filter

The output of the tuned stage is fed to a low-pass filter comprised of R6 and C5. Capacitor C5, like C1, is made up from several capacitors in parallel.

This filter has a cut-off frequency of 900Hz with the values specified. However, this can be varied to suit the user's requirements.

The Audio Stage

The audio power amplifier stage is an LM380 in a standard circuit. It can supply up to 2.5W of audio.

A switch is used to connect the speaker either to the output of the filter or bypass it completely, thus enabling the internal speaker to be used as an extension speaker for voice, or as a filtered speaker for c.w.

More than enough output can be obtained from an LM380, even with a 9V supply. The variable resistor R7 is adjusted to give the same volume on c.w. as the other modes.

Computer Simulation

I used a circuit simulation program on my computer to create the original of the filter response curve, shown in **Fig. 2.** The vertical scale denotes attenuation (-dBs), while the base line is the frequency from 500Hz to 1.4kHz.

Construction

For construction, Veroboard or matrix board (perfboard) can be used, or you could produce your own p.c.b. I opted for the 'land', or 'surface mount', technique on a p.c.b.

Using this method, the components are placed on the same side as the tracks. This saves the need for drilling and makes for simple construction.

You should remember that, if you're using the 'surface mount' method, you're laying out for the right side. I have shown the layout I used for my filter in **Fig. 3**. The layout isn't that important at these frequencies, so go ahead and build it into a case.

I used a plastics box to house the project, battery and the speaker. No problems were experienced using a 100W transmitter nearby. If you have a higher r.f. field in your shack, you might need to enclose the filter in a metal screened box. The circuit may be powered from an internal battery, making it more portable.

Setting Up

If all is well with the soldering, etc., then connection to a suitable receiver is all that is needed. With the filter switched out, the radio's output, is connected directly to the loudspeaker acting as an extension speaker.

With the filter in, the audio should take on a tunnel-like sound. Tuning across a c.w. signal should produce a most pronounced peak at resonance. The variable resistor R7, is then adjusted to give a similar volume to the unfiltered audio.

PW

Further reading:

Ray Fautley G3ASG has dealt with inductive and capacitive reactance at resonance, in 'Mathematics For The RAE' on page 62 of PW *January 1993.*

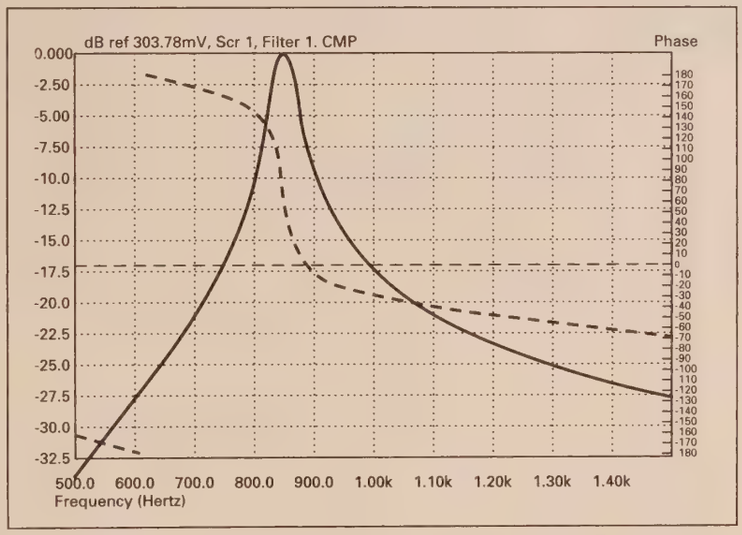


Fig. 2: Using a computer to simulate the circuit, Ben Nock G4BXD, ended up with this type of response. It is centred rather higher than the designed frequency, but he didn't notice any difference. The overall phase angle is shown dashed.

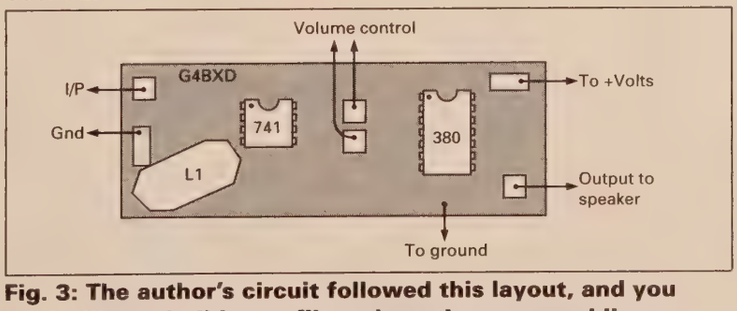


Fig. 3: The author's circuit followed this layout, and you might like to build your filter along these general lines.

Shopping List

Resistors

Carbon Film 1W 5%

2Ω	1	R8

Carbon Film 0.25W 5%

10kΩ	1	R2
47kΩ	1	R1
100kΩ	4	R3, 4, 5, 6

Variable trimmer

2MΩ	1	R7

Capacitors

Polyester

1.8nF	1	C4
10nF	1	C11
22nF	2	C2, 3
0.1µF	2	C6, C8

Electrolytic 16V working

4.7µF	1	C7
220µF	2	C10, C12
470µF	1	C9

For C1 and C5 see the text for more information.

Semiconductors

741	1	IC1
LM380	1	IC2

Miscellaneous

A small section (to suit) of Veroboard or 'perfboard', a two-way change-over switch, small 8Ω loudspeaker, interconnecting wire, sockets to suit, and a medium-sized plastics box.

WHAT A GOOD IDEA

Dipole Field Strength Meter

A field strength meter (f.s.m.) is an extremely useful piece of equipment in any amateur's workshop. With the f.s.m., evaluations and comparisons can be made on any home-built, experimental or commercial antenna.

The following design requires no batteries and is both simple, in design and construction, as well as useful over a very wide band of frequencies. Look at the drawing of **Fig. 1** to see just how simple it is to make. The meter was a small unit removed from a tape recorder, but almost any general meter of around 100-200μA would be suitable.

It may be used with either vertical or horizontal polarisation, detecting peaks and troughs in the r.f. field, as well as a relative front-back ratio of the antenna under test. It can also be used to show if an antenna has a 'squint' in its radiation pattern.

Operation

In operation, for maximum sensitivity, each half of the antenna should be adjusted to a λ/4 at the working frequency. In practice this is only possible at v.h.f. and u.h.f. When used at h.f., each of the telescopic rods is extended to its maximum length. The trim-pot is adjusted to give a suitable reference reading on the meter (M1) before making comparisons.

In tests at my location, signals from a 144MHz transmitter, with an e.r.p. of about 100W, could be easily measured at about 20m distance.

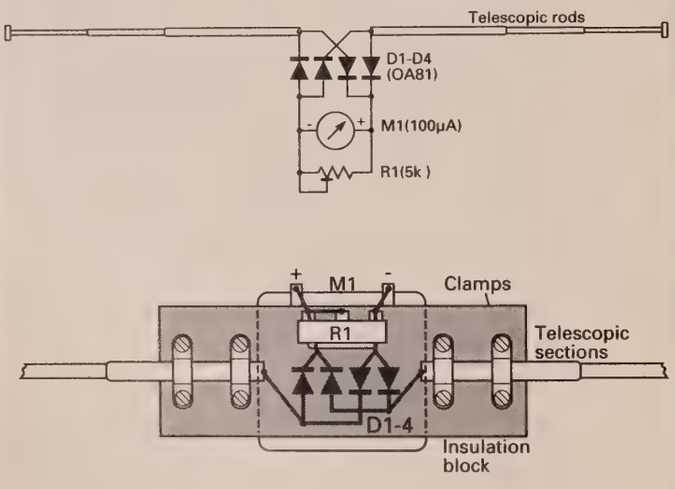


Fig. 1: The circuit diagram of the f.s.d., the telescopic elements should ideally be λ/4 at the working frequency at v.h.f./u.h.f., or as long as possible at h.f.

Modifications

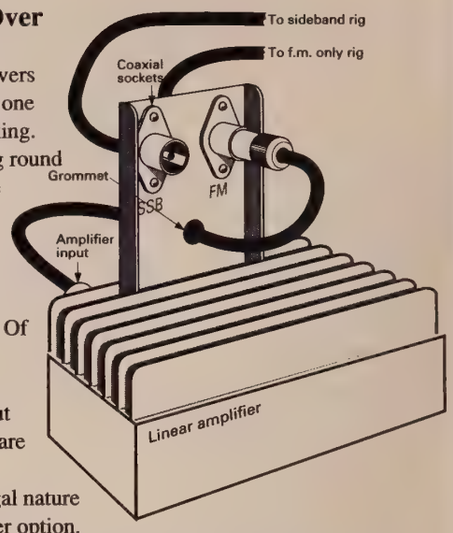
For greater sensitivity at h.f., helically wound sections could be fitted at the base of the telescopic elements. A little experimentation would be necessary for these sections. A starting point to try is 250 turns of 0.5mm (26s.w.g) enamelled copper wire, close-wound on a 12mm diameter wooden dowel. This takes about 18-20m of wire for each side.

D. J. Smillie GM4DJS
Wishaw
Strathclyde

Cheap Change-Over

I have two transceivers for the 144MHz band, one for each mode of working. After a while, reaching round the back of each of the rigs to connect the power amplifier stage, became a chore.

There had to be an easier way of doing it. Of course there was, and only a change-over switch was needed. But change-over switches are very expensive, and naturally being of frugal nature I investigated a cheaper option.



The solution shown was my cheap option change-over. It should work in all cases, not just between different mode rigs.

Hector Cole G3OHK
Seaton
Cumbria

Home-Brew Antenna Connections

"How much did you say that antenna cost", you ask incredulously, as you learn the extent of the damage for the few pieces of aluminium rod, and the couple of lengths of wire, you inquired about. "But after all, it's only a few sections of rod and wire".

The trouble is, that it's the shape and postions of those few pieces of aluminium and copper that make the difference.

Super Antenna?

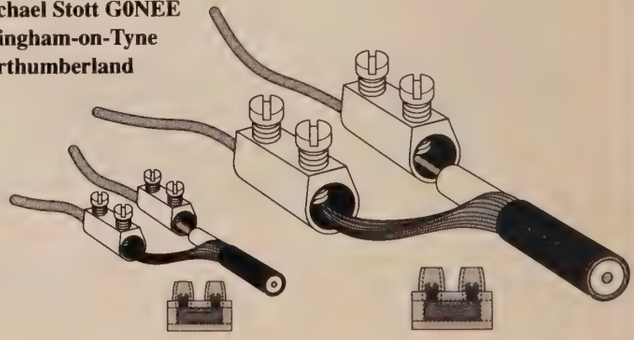
My 'Wagi' should help you turn a collection of wire into a super antenna. One of the problems encountered when working with wire antennas, is that of adjustments, and making a good connection. Not every soldering iron is fitted with a 20m lead, or is adequate to maintain an adequate temperature in the slightest of breezes.

Small portable butane-powered soldering irons go some way towards offering an answer, but often run out of gas at the critical moment. Stood at the top of a swaying ladder with two pieces of hot, but not hot enough to melt solder, wire is not my idea of fun. At least not when I'm that person it isn't!

Well what is it? The answer is of course 'choc-bloc' connectors. These are available in a variety of sizes to suit almost any size of wire. They also cut through the covering of almost all forms of insulated wire available these days, and give a good air-tight joint.

To minimise wind resistance they are removed from the plastics section in which they normally reside. Look at the drawing and I'm sure that all will fall into place. They provide an easy, convenient and above all, secure fixing, that can be changed quickly to create that perfect collection of wires and metal.

Michael Stott G0NEE
Ovingham-on-Tyne
Northumberland



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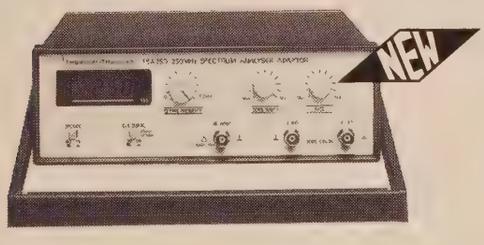

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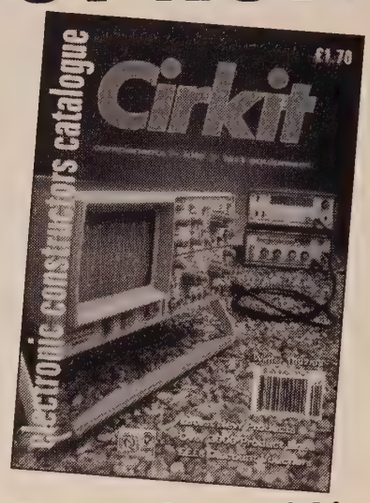

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VLF Up-Conve

Down below the long wave band there are many interesting signals to be heard, both natural and man-made. Adrian Knott G6KSN shows you how to make these signals audible on a communications receiver.

Some readers will doubtless possess a communications receiver. Whilst the majority of these sets perform very well in the h.f. band, most do not cover the frequency range below 500kHz. My interest in l.f./v.l.f. was aroused some years ago, when I found an article on decoding time transmissions from the atomic clock signal on MSF (on 60kHz).

Transmissions below 150kHz, potentially, have ranges of many thousands of kilometres. Signals in this band include radio navigation, standard frequencies and submarine communications. There are also naturally occurring phenomena between about 1kHz and 20-30kHz.

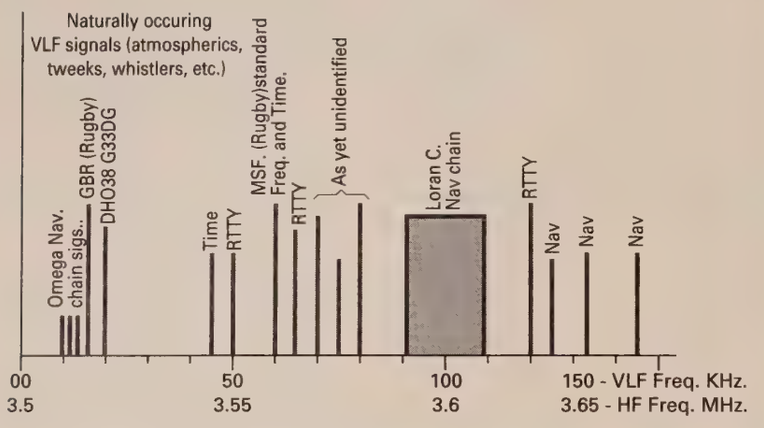

Fig. 1: Many, interesting signals are to be found below the long wave broadcast band. Using the up-converter described here, will make them audible in the 3.5MHz band as shown here.

The converter described here translates frequencies, in the range 500Hz to 150kHz, up into the 3.5MHz amateur band. A standard communications receiver will then allow you to listen in on this rather strange, and intriguing part of the electro-magnetic spectrum. If you look at **Fig. 1** you will see the range of signals.

Converting A Signal

Converting a 60kHz signal to 3.560MHz presents no real problem, but consider converting 10kHz up to 3.510MHz. With the converter local oscillator running at 3.5MHz and a conventional mixer all hell is let loose.

What we have done is to generate a very strong signal (the l.o.) only 10kHz away from our wanted (and very much weaker) signal. The result of the strong nearby signal, is to overload the front end of the communications receiver (and probably the i.f stages as well if a mediocre filter is used). This will result in our v.l.f. signal being lost under an enormous blocking signal.

The answer to the converter problem is to use a balanced mixer in the up-converter. Using a balanced mixer, results in a great reduction in the l.o. breakthrough. Even the most elementary of receivers should resolve the signal.

Final Design

The circuit in **Fig. 2** is the final design I arrived at. Since we are dealing with low frequencies, the r.f. amplifiers may be broad band and rolled off gently above 150kHz.

The v.l.f. signal from the loop is fed into the base of Tr1 via C1. This, in conjunction with the input impedance of the first stage, forms a high pass filter from about 500Hz upwards.

Stage gain is adjustable with R6, while capacitor C2 in the collector circuit of Tr1 reduces gain above 150kHz. Transistor Tr2 is another gain stage (C7 reduces gain above 150kHz), feeding the phase splitter Tr3. This phase splitter stage, Tr3, provides two signals of the same level but 180° out-of-phase with each other at outputs A and B.

The transistors, Tr5 and Tr6, form the balanced mixer, and must be matched for gain. The mixer, is symmetrical, but in addition, variable resistors, R25 and R27, improve the balance of the mixer, reducing l.o. breakthrough to a minimum.

Crystal Controlled

The converter oscillator is crystal controlled, and almost any parallel resonance fundamental crystal in the range 3-5MHz will do. Transistor Tr4 and its associated components form a crystal controlled, Colpitts style, local oscillator.

Capacitor C13 may be a 60pF trimmer if precise control of frequency is required. The output of the oscillator is taken from the emitter of Tr4, and fed into the mixer via identical networks C20, R23 and C21, R24.

The up-converted output from the mixer, is taken from the collectors of Tr5 and Tr6 via the output transformer T1. Transformer T1 primary is 24 turns, centre-tapped, of 0.27mm (32s.w.g.) enamelled copper wire. The secondary is 12 turns of the same wire.

In the prototype, T1 was wound on two ferrite beads, or you could use a T50-2 toroidal ferrite core. Both methods are shown in **Fig. 3**. Either method should prove satisfactory. The number, and ratio, of turns could be experimented with, to give best overall results.

Straightforward

Construction is quite straightforward, and the unit can be built on Veroboard or similar. Layout is not critical, as long as the following guide-lines are observed:

1) Keep the input of Tr1 as far away as possible from the output of Tr2.

2) Tr5 and Tr6, should be laid out on the board as symmetrically as possible and leads kept as short as possible.

3) If the oscillator is some distance from the input to the mixer then it should be fed via screened cable to avoid stray pick up.

4) The case of the crystal XL1 should be earthed by means of a short length of wire soldered firmly to the ground.

5) The finished projects should be mounted in a metal (preferably die-cast) box in order to minimise local oscillator radiation.

What Antenna

What kind antenna to use? A long-wire antenna has a very high impedance at these frequencies, unless it is several kilometres long. This form of antenna also seems to suffer from electrostatic breakthrough.

A resonant loop system was developed to interface into a load of about 10K. This reduces the *Q* of the loop for easier tuning, and accommodates the bandwidth of some of the signals found.

rter

The circuit of the antenna is shown in **Fig. 4**. It consists of 34 turns of 1mm covered copper wire, wound to give a loop diameter of 60cm (yes that's right - 24 of the old inches). A length of thin plywood or hardboard could be used to make up a former for the loop.

The loop is tapped to give 12 possible values of inductance. The tapping points are chosen so that moving along the coil by one tapping point, results in a frequency change of approximately 10%.

A 12-position switch S1 selects the appropriate tap. The parallel resonating capacitors, C_L and C_H are selected by S2, giving frequency coverage from 11.8 to 36.4kHz, with C_L, and 37.3 to 115.3kHz with C_H respectively.

Loop resonant frequencies are dependent on the settinng of S1 and S2. The two switches, and associated capacitors, may be mounted in the same case as the converter.

The loop itself could be attached to the converter case. Alternatively, the loop could be remotely mounted in an auxiliary case and connected to the converter by means of a short length of coaxial cable. The exact method of construction is a matter of personal preference, and the drawing of **Fig. 4** is merely a guide.

Setting Up

To start setting up, apply 12V to the unit, and check that the converter oscillator is working. To do this, tune a receiver to the oscillator frequency.

A short length of wire, connected to the emitter of Tr4, should create quite a strong signal for the receiver. If a known accurate receiver is available, and you have chosen to make C13 variable, then you can set the local oscillator frequency.

Set the b.f.o. on the communications receiver to centre point. Now trim C13 to give zero beat at 3.5MHz, or whatever other crystal frequency you have chosen. Remove the wire 'antenna' from Tr4, and connect the converter directly to the communications receiver by means of a good quality coaxial lead.

At this point the local oscillator signal may well give a reading of 60dB over S9 on the meter of the receiver. However, by careful adjustment, and re-adjustment, of R25 and R27, it should be possible to reduce the converter oscillator, to become less than an S5 signal.

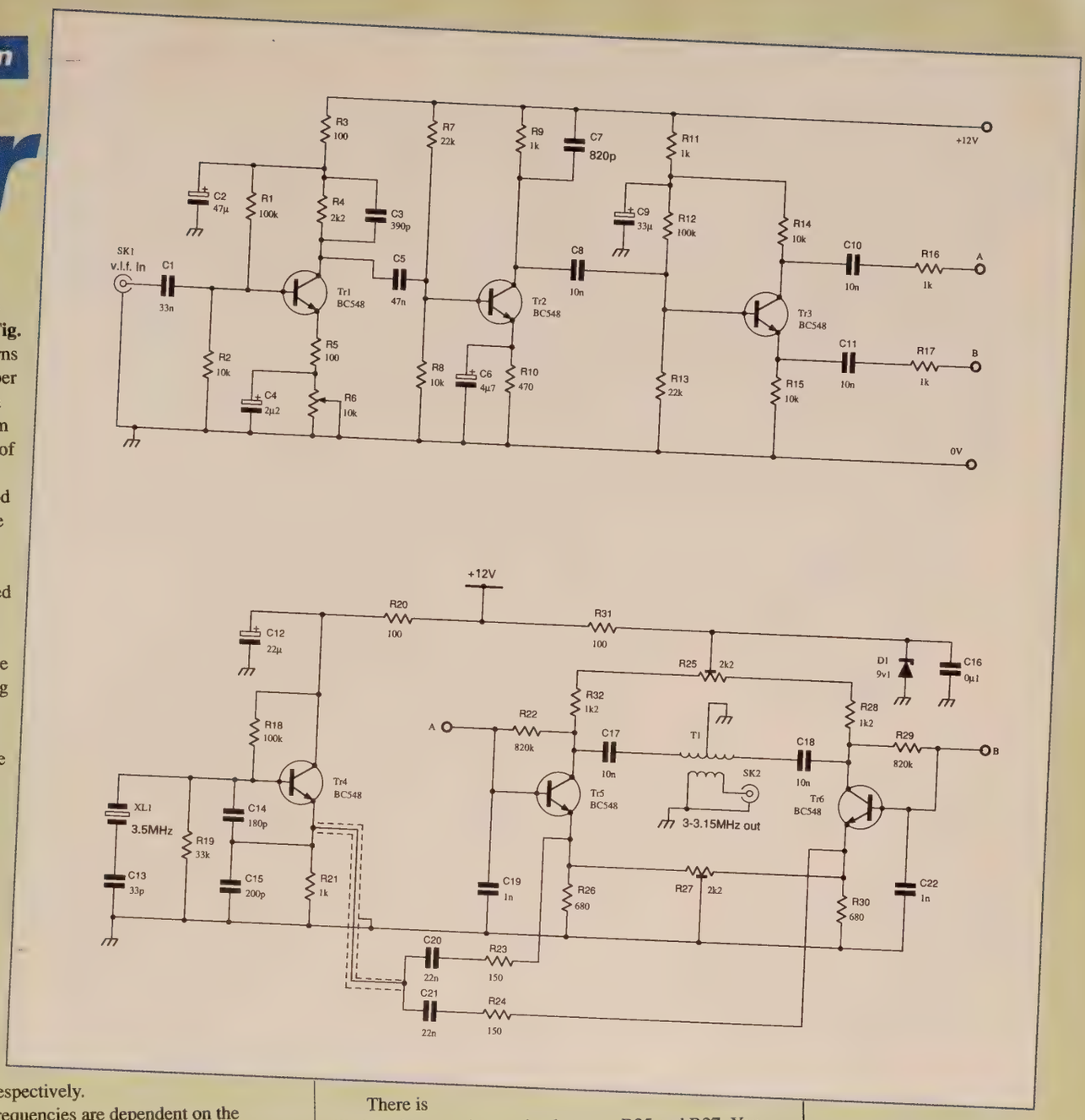

Fig. 2a: The circuit of the pre-amplifier and phase splitter section of the project.

Fig. 2b: The local oscillator and balanced mixer section. Points A and B couple to the similarly marked points in Fig. 2a.

There is likely to be some interaction between R25 and R27. You may have to carry this step out several times until no further improvement in local oscillator suppression can be achieved.

At the antenna, set S1 to position seven and select C_H (10nF) by means of S2. Then tune the communications receiver to 3.560MHz (or your chosen crystal frequency + 60kHz), where you should be able to hear a carrier pulsing at one second intervals.

At my location, this signal is endstopping on the S-meter. Now check that R6 alters the sensitivity of the unit, and that switching in C_L, or altering the tapping point, degrades the received signal on 60kHz. If all is well, then no further adjustments are necessary and the unit is ready for use.

Man-made Signals

The unit has been in use at my location for some time now, and some very strange signals have been heard. The omega signals around 12kHz are reasonably strong and GBR, DHO38, MSF and some other unidentifiable signals are received and indicated full-scale on the S-meter.

Since a lot of the signals present on v.l.f. are either data or RTTY, I think that a computer terminal/modem would be a useful addition to my shack. This is to be my next line of investigation.

Continued over

Natural Signals

Whistlers, Growlers, Tweeks and other types of naturally occurring v.l.f. signals, have also been heard. The levels of these atmospheric signals are at times, strong enough to obliterate the Omega Navigation beacons.

In many hours of continuous listening, the v.l.f. band has proved to be very interesting. The very low frequency band has proved to be a useful addition to my communications receiver, which lacked coverage of this fascinating part of the electromagnetic spectrum.

PW

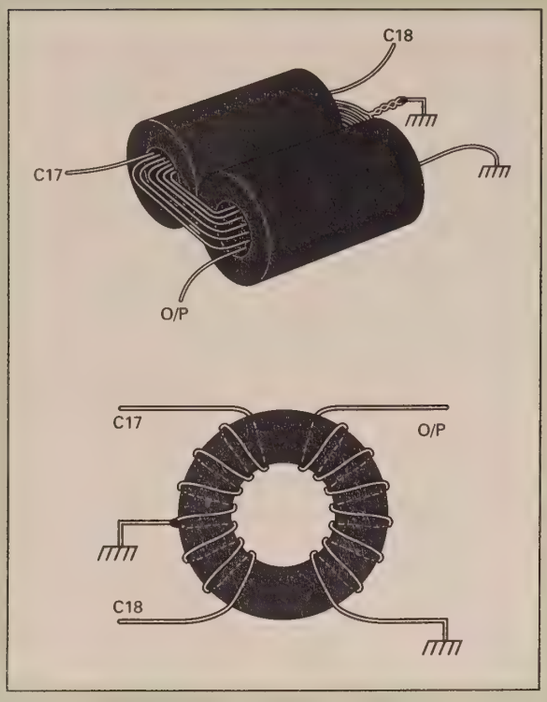

Fig. 3: Two possibilities for transformer T1.

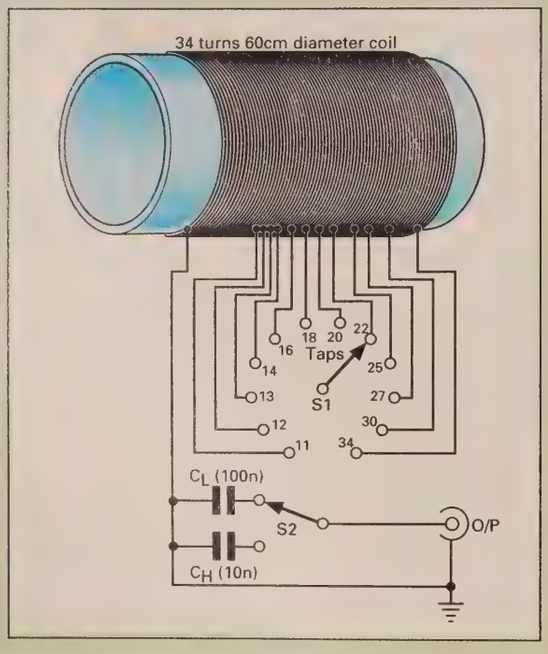

Fig.4: A representation of the antenna loop. The actual diameter of the loop is 600mm (24 inches).

Shopping List

Resistors

Carbon Film 0.25W 5%

100Ω	4	R3, 5, 20, 31
150Ω	2	R23, 24
470Ω	1	R10
680Ω	2	R26, 30
1kΩ	5	R9, 11, 16, 17, 21
1.2kΩ	2	R28, 32
2.2kΩ	1	R4
10kΩ	4	R2, 8, 14, 15
22kΩ	2	R7, 13
33kΩ	1	R19
100kΩ	3	R1, 12, 18
820kΩ	2	R22, 29

Variable miniature trimmer

2k2	2	R25, 27
10k	1	R6

Capacitors

Low voltage polystyrene

33pF	1	C13 (may be 60pF trimmer see text)
180pF	1	C14
200pF	1	C15 (220pF would also be suitable)
430pF	1	C3 (390 or 470pF might be suitable)
820pF	1	C7
1nF	2	C19, C22

Miniature polyester

10nF	6	C8, 10, 11, 17, 18, C_H
22nF	2	C20, 21
33nF	1	C1
47nF	1	C5
100nF	2	C16, C_L

Miniature electrolytic 16V working

2.2µF	1	C4
4.7µF	1	C6
22µF	1	C12
33µF	1	C9
47µF	1	C2

Semiconductors

BC548	6	Tr1-6
C9V1	1	D1

(any 500mW 9.1V zener diode would be suitable)

Miscellaneous

Crystal of 3.5MHz (or other suitable frequency), 1m of 0.27mm enamelled copper wire, about 70m of 1mm covered (enamelled) copper wire for the antenna coil, die-cast box to house the finished project. Various sockets to suit, miniature coaxial cable, and link-up wire, a single-pole 12-way switch for S1, and a single-pole change-over switch for S2.

Further Reading

'The Largest Antenna In The World' by Brian Dance in the September 1983 issue of *PW*, pages 40 /41. ‡
***Guide to Facsimile Stations* by Jeorg Klingenfuss, has frequencies for facsimile stations in the 50-145kHz band. ‡**
***Guide To Utility Stations* by Jeorg Klingenfuss, has frequencies for utility stations in the 50-145kHz band. ‡**
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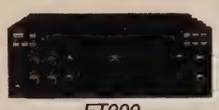
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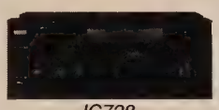
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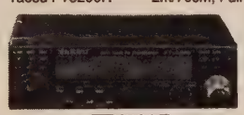
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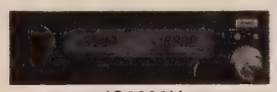
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	ICOM Accessories		
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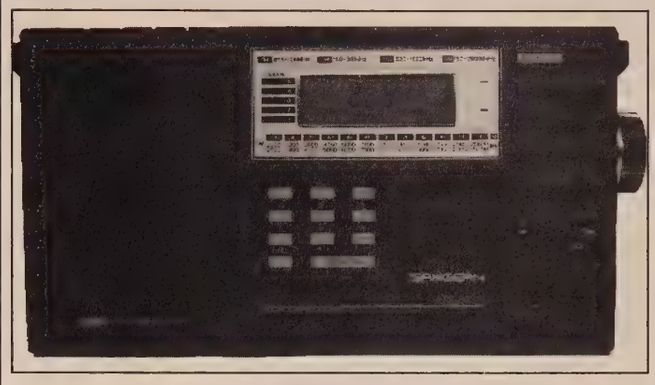

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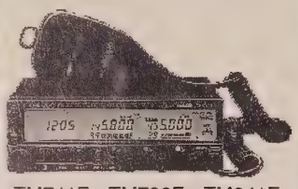

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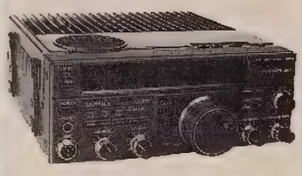

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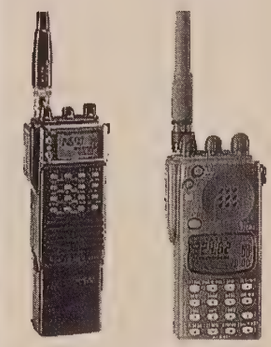

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EDDYSTONE RADIO TRIBUTE

Although they are not involved in the amateur radio field nowadays, *PW* couldn't ignore the contribution that Eddystone Radio receivers have made to our hobby. So, what could be more appropriate than having a front cover, showing an Eddystone 'classic' from the past, alongside one of their products from the 1990s in our themed issue on receivers?

Eddystone Radio Ltd., now a Marconi Communications Systems Company, still operate from the Eddystone Works, Alverchurch Road in Birmingham. However, this famous factory now produces a range of high-tec communications and military specification radio equipment.

Nowadays, the firm produces a wide range of radio communications and broadcasting equipment. And, perhaps without realising it, many radio enthusiasts probably listen to v.h.f. radio every day, totally unaware that it's an Eddystone Radio Band II v.h.f. f.m. transmitter that's providing the power behind the programme.

While *PW* pays tribute to the famous Eddystone name, many radio enthusiasts, continue to use their receivers. It's good to know, that although they're not into amateur radio nowadays, the famous Eddystone lighthouse logo continues to shine with confidence in the 1990s.

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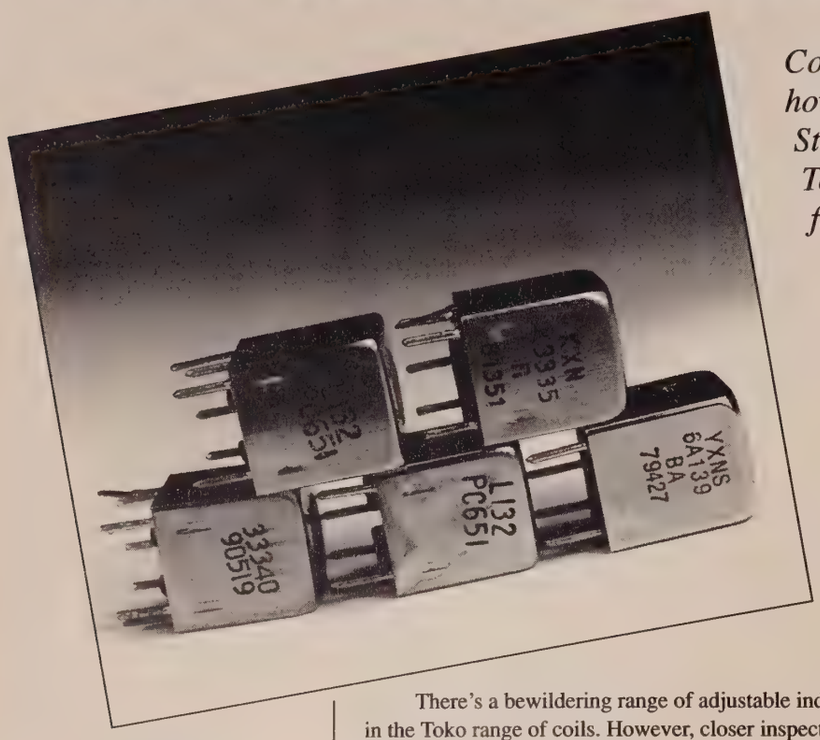
Coils - The Basic Building Block



Coils are to be found in almost every radio set, but how can we identify the various types? We asked Stefan Niewiadomski to give us a summary of the Toko 10K and 10EZ series of coils that seem to be found in most sets.

Review

There's a bewildering range of adjustable inductors in the Toko range of coils. However, closer inspection of the specifications of these components reveals great similarities between many of them. The tables used in this article, catalogue the most useful coils in an order that should make these similarities obvious.

The full code for each coil is not shown, only the unique identifying number. In **Table 1** take, for example, the full code for coil type 7752, is RW06A7752EK, whereas the full code for the 6438 type is 15FN8A6438EK. Details of these codes can be found in the Bonex, Cirkit and Mainline mail order catalogues, along with the ordering code specific to the distributor.

I've only included the coils from Toko's 10K and 10EZ ranges in the tables. These represent the most popular ranges with amateurs, and they crop up most often in articles and kits. There are also ranges of 7mm and 5mm coils which may be encountered occasionally, but these are rather less extensive than the 10K and 10EZ coils and are generally only needed where more miniaturisation is required.

A new aspect to the miniaturisation of coils has recently reached the amateur scene, in the form of surface mount components, but, again, these have not been considered here. Incidentally, the 10, 7 or 5mm dimension refers to the nominal outer width and breadth of the can.

As well as showing the inductance and colour of the core, the tables show the number of turns between the pins for each coil. These figures are useful where a tapping point and/or where the ratio of the primary/secondary winding is needed.

Antenna And Oscillator

General purpose, antenna and oscillator coils are shown in **Table 1**. This range of coils is suitable for use in antenna input filter, oscillators and other general applications.

In an application where only the primary winding of a coil is used (that is the pin 1-3 winding), there's not much too choose between coils with the same inductance. For example, if a 5µH coil is required, the type 334, 6439, 6440 or 3337 would be suitable. Where these coils differ, is in the primary/secondary ratio and, where the primary winding is tapped. Even so, the 6439 and 6441 are so nearly identical that it is doubtful that any difference in performance could be detected in amateur applications.

The 4174 and 4173 are intended for use in 5MHz v.f.o.s and 9MHz (c.i.o.) respectively.

When coil data is tabulated as in **Table 1**, it can be seen that the colour of the core (or a ring of plastics visible from the top of the can) is a good indication of the inductance of the coil. This can be a good way of identifying a coil which has had its markings rubbed off, which can easily happen when they are handled.

A better way of being sure which coil is which, is to scratch the codes onto the cans when coils are received. Then, even if the original markings are lost, the scratched code will still be visible. (*The method I use is to paint fishing rod varnish, available from fishing tackle suppliers, over the original markings*. Editor)

Lower Frequency

The coils shown in **Table 2.** are suitable for use in lower frequency i.f. strips in the range 455-468kHz. In practice there's not much to choose between coils which are specified for use at 455kHz and 468kHz.

Enough adjustment range is available for either type of coil to be used at either frequency. In fact, there is sufficient adjustment to go considerably above 468kHz and below 455kHz if required.

The different ratios of primary/secondary windings are intended to give different input/output impedance transformations. The 4A888 and 17105 are particularly useful, since they have centre-tapped primaries, making them useful for integrated circuit i.f amplifiers which have push-pull outputs, such as the MC1350 or the NE/SA602.

Generally Suitable

All the coils shown in **Table 3.** were designed for use in f.m. i.f. systems at 10.7MHz. However, coils designed for 10.7MHz are generally suitable for use at 9MHz, a popular i.f. with amateurs. The adjustment available by screwing the core in and out is usually about ±30% of the nominal value.

All the coils except the 30455 have an internal capacitor fitted which resonates the coil at the i.f. frequency, which can be set exactly by adjusting the coil's core.

Again, the different ratios of primary/secondary windings available (for example, with the 3892, 3893 and 3894) are intended to give different input/output impedance transformations. As in the low i.f. coil range, there are coils in this category, namely the 3892, 3893 and 3894, that have centre-tapped primaries.

Standard Pins

Luckily, there's a standard layout used for pins, at least on the Toko range of coils. The pin numbers for the windings shown in the tables refer to the pin-out shown in **Fig. 1**. Here the coil is viewed as looking onto the pins, or from the track side of the p.c.b.

Main Suppliers

Here in the UK, there are three main sources of Toko coils, they are:

Bonex, 12 Elder Way, Langley Business Park, Slough, Berks. Tel: (0753) 49502.

Cirkit, Park Lane, Broxbourne, Herts EN10 7NQ. Tel: (0992) 444111 or FAX (0992) 464457.

Mainline Electronics, PO Box 235, Leicester LE2 9SH. Tel: (0533) 780891 or FAX (0533) 477551.

There are several smaller firms who carry stocks of the Toko series of coils. Many of these small firms are to be seen at rallies throughout the year, so take these pages with you. You never know when they will come in handy!

PW

Review

Table 1: General purpose, antenna and oscillator coils.

Code	Inductance	1-2	2-3	1-3	4-6	Colour
7752	630uH	9	114	123	13	green
6408	360uH	95	3	98	13	red
331208	330uH	2	92	94	8	red
6A356	158uH	3	64	66	7	blue
80046	158uH	2	79	81	9	blue
3333	45uH	14	41	55	4	violet
6438	45uH	10	30	40	8	violet
3426	38uH	3	48	51	4	white
6440	38uH	10	31	41	9	white
32696	23uH	3	45	48	6	white
3334	5.5uH	7	11	18	3	yellow
6439	5.5uH	4	10	14	6	yellow
6441	5.5uH	4	11	15	7	green
3337	5uH	2	23	25	3	green
4174	4.8uH			17		black
4173	3uH			15	3	brown
4612	1.7uH			11	3	white
4613	1.7uH			11	1	white
4172	1.4uH	1	8	9	3	black
2225	1.4uH	1	8	9	1	black
3335	1.2uH	4	4	8	2	pink
3767	1.3uH	2	6	8	5	pink
3428	1.1uH	2	8	10	3	blue
3766	1.1uH	2	6	8	5	blue

Table 2: 455kHz/468kHz IF coils.

Code	Capacitor	1-2	2-3	1-3	4-6	Colour
11098	180pF	140	25	165	4	orange
12374	180pF	127	38	165	6	yellow
11100	180pF	104	36	140	20	black
1A589	180pF	15	125	140	6	blue
1A590	180pF	80	60	140	15	white
4A888	430pF	55	55	110	15	black
17104	180pF	98	67	165		yellow
17105	200pF	68	68	136	68	yellow
41996	180pF		43	164	16	red
41997	180pF		19	164	16	blue

Table 3: 9MHz/10.7MHz IF coils.

Code	Capacitor	1-2	2-3	1-3	4-6	Colour
30466	none	6	3	9	1	pink
30465	120pF	6	3	9	1	brown
4520	50pF	8	7	15	1	red
3892	82pF	7	7	14	2	red
3893	82pF	7	7	14	3	red
3894	82pF	7	7	14	4	red
1506	51pF	3	12	15	2	black
6184	82p	10	3	13	3	black

Fig. 1: Two common pin-outs, as seen from below. The lower coil has a capacitor fitted to become an r.f. transformer. See Fig. 2.

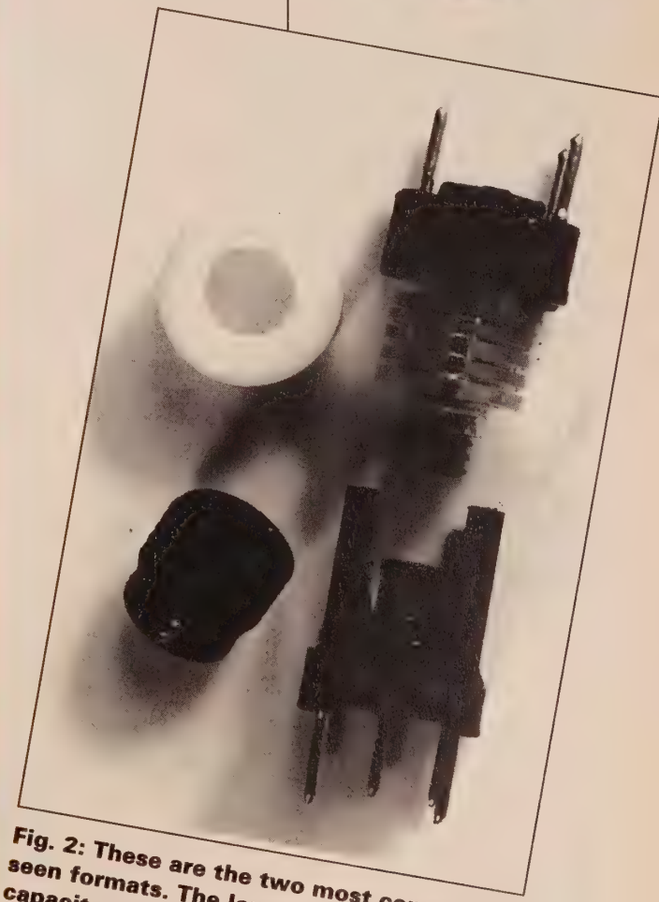


Fig. 2: These are the two most commonly seen formats. The lower one may have a capacitor fitted as shown in Fig. 1.

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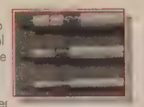

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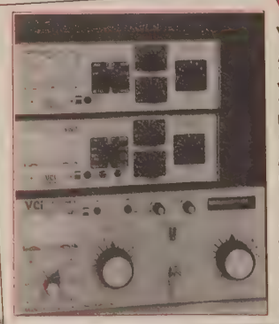

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Antenna Workshop Review - The Bark

This month's workshop from the *PW* antenna specialist Peter Dodd G3LDO, takes the form of a review. Presenting the evaluation, Peter reports on an antenna he first saw while on holiday in Tahiti.

The view from the window of our room at the Hotel Mahina-Tea in Papeete, Tahiti, was unusual enough to justify me taking a photograph. However, my wife Erica was incensed, because the subject of the photograph was an antenna!

She was upset because this was the first stop on our once-in-a-lifetime, round-the-world-trip. And all I could find to photograph were antennas! However, this collection of hardware was a little different.

Masts And Towers

The masts and towers visible above the palm trees and the roofs of the local gendarmerie (police headquarters) supported a conventional cluster of v.h.f. arrays. But between these masts, were strung what appeared to be wide-spaced folded dipoles.

Each of the folded dipoles had a long tubular lump at the centre, that spanned across both wires of the elements. Some were fed with coaxial cable, and others with open wire feeders.

I had never seen anything like these antennas used in amateur radio, although in the back of my mind I did recall seeing something in an article or book somewhere. I wondered if the antennas were perhaps some kind of wide-band dipole.

We continued our holiday, and apart from my photograph, I thought that was the end of the story. It seemed it was, until G3XFD called me!

During a recent telephone conversation with the *PW* Editor, I was told about a Barker and Williamson antenna he said he would like me to review. As he described the antenna, I soon realised it was very similar to the one I had seen from a hotel window in Tahiti nearly a year earlier.

What a strange coincidence! I accepted the job of course, because I was more than interested to see how the antenna would perform on the amateur radio bands.

Antenna Delivered

The antenna was delivered in a box measuring 700 x 180 x 260mm. Inside were two cardboard tubes on which were rolled the two halves of the 'dipole'. The installation instructions were printed on both sides of a single A4 sheet.

The manufacturers also included instructions for fitting and diagrams for various configurations. The Barker and Williamson Model BWD1.8-30 broadband dipole is designed, as the name suggests, for operation from 1.8 to 30MHz. The antenna comes fully assembled and pre-tuned, so no measuring or cutting is required.

The complete antenna is weather rated at 1 to 2kW peak envelope power (p.e.p.) c.w./s.s.b amateur or intermittent commercial service. These specifications permit use of the full capabilities of today's continuous coverage transceivers.

An added useful feature is the single feed-line operation on all bands. The system is also robust, because the BWD1.8-30 antennas are made from 14s.w.g. stranded copper wire, with a balun and matching unit.

Very Rugged

The BWD1.8-30 antenna is certainly very rugged, and it appears to have been designed for commercial use. The metal fittings are made from stainless steel, and the antenna in appearance does, as I've already mentioned, look like a folded dipole.

The antenna is 27.4m long, with approximately 450mm spacing between the two elements of the fold. In the centre of each element, there are two rather heavy tubular units made from plastics material.

The unit in the top element is described by the manufacturers as a balancing network. The unit in the lower element, where the coaxial cable feeder is connected, is described as a balun. The coaxial cable is connected to the balun via an SO-239 female connector.

To try the system on the bands, I decided to mount the antenna on the chimney of my house. The reason for this decision, was that all previous multi-band wire antennas used in this location proved difficult to feed and were inefficient.

There are probably several reasons that the house appears to be a radio frequency black hole! One reason may be the spider's web of telephone wires radiating from a nearby distribution pole to many of the houses in the area. Another reason why there have been problems in the past, could be the house plumbing. This comprises a mixture of steel, lead and copper pipes.

Chimney Pole

The top of the chimney where I mounted the antenna, is about 9m above the ground. When erecting the system, I fixed a 2.5m length of scaffolding pole to the chimney with a double TV lashing kit.

Fig. 1: On his way to the top of his profession! Peter Dodd G3LDO preparing to erect the BWD1.8-30 antenna on the stub mast on his QTH chimney.

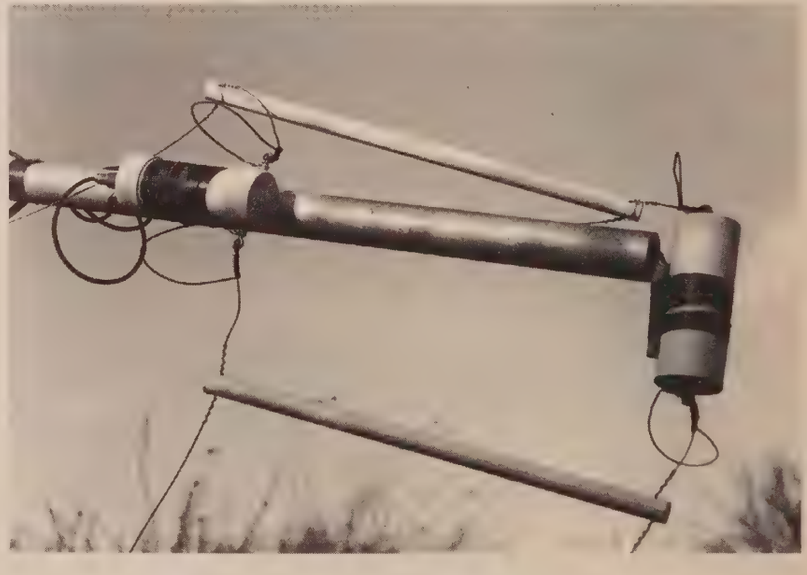

Fig. 2: The BWD1.8-30 balun (left) and the matching unit (on top of the stub-mast) ready for mounting on the house chimney. The units shown are mounted in heavy duty plastics containers, and all metal components are manufactured from stainless steel.

And Williamson BWD 1.8-30 Antenna

The scaffold pole gave the antenna a reasonable clearance above the roof. The centre of the dipole was attached to this, so that it supported the heavy balun and balancing unit.

The sides of the antenna were connected to short poles on either side of the house. Erected in this way, the antenna formed an inverted V.

Five minutes after the antenna was erected, the coaxial cable was connected and everything was ready. I switched on my FT707, which happened to be on 21.280MHz.

I heard a station, and with an eye on the s.w.r. meter, because this was the very first time I had used this antenna, gave him a call. It turned out to be J28GG in Djibouti, and I was given a R5/4 report. Not bad for a start!

I then tried loading the transmitter on all other bands. The FT707 does not cover 1.8 to 2MHz, so this band was not tested. But on the other bands, the s.w.r. was similar to that given in the literature supplied with the antenna.

Testing The Antenna

I operated on all bands except 1.8MHz, for a period of several weeks, testing the antenna. I had expected to find some trade-off in efficiency, that can be expected with an all-band antenna compared with a resonant dipole.

I was really surprised how well BWD1.8-30 antenna worked in such a poor location. I worked DX (outside Europe) on all bands, and as I had never worked on the 18 and 24MHz bands before, the operation was a new experience.

I also tried the antenna in a different location, on top of the 12m high mast in the back garden. The new site provided a slight improvement on receive, in as much as the noise level was lower.

Over the next four weeks of the tests, the improvement in the antenna's location, was not matched by the same improvement in signal reports from DX stations. The signals were stronger, but only by about one S-point.

Performance

In both test locations, the BWD1.8-30 gave a reasonable performance. It worked well on the 3.5, 7 and 28MHz bands, and particularly well on the 18 and 21MHz bands.

On 21MHz, I was even able to break into a QSO between ZL2AB and special event station ZL6RFA. I also managed several long path QSOs with Japanese stations.

Several USA stations were also worked on the 24MHz band. I also had a couple of transatlantic QSOs on 28MHz, but I felt that the performance was down compared with 21MHz.

On 14MHz, the performance appeared less than on other bands. My results showed it was approximately two S-points down on the 2-element Double-D (Compact 2-element mono-band beam) that normally sits on top of the 12m mast.

Mind you, the antenna performance on 14MHz may be a physiological effect. You've got to remember that 14MHz is a 'heavyweight' band, where you have to compete with high power stations with big beam antennas.

What Is It?

The BWD1.8-30 antenna does not behave in the way of resonant dipoles, which I've tried many times before in these locations. So what is it?

In response to a phone discussion with Peter Swallow G8EZE, I did some research and read John Heys G3BDQ's book *Practical Wire Antennas*. The G3BDQ book had a section describing the 'T2FD' (Terminated Tilted Folded Dipole) antenna. It also described a design with the lowest frequency of 7MHz.

The book says: "When set at its optimum slope angle of 30°, the T2FD displays an almost omni-directional, low angle radiation pattern similar to that of the vertical quarter-wave. To be effective, a 7MHz dipole needs to be supported at around 18m, but the T2FD will work at 11m."

The article also had a reference, from the *QST* for June 1949 'An Experimental All-Band Non-directional Transmitting Antenna' by Commander G. L. Countryman of the United States Navy.

By Chance

Purely by chance, I had a photocopy of the *QST* article mentioned in the G3BDQ book! I came by it while researching material for my book *The Antenna Experimenters Guide*. I had copied it from Al Slater G3FXB's library of ancient and modern *QST* magazines.

In this article, the antenna is described as an aperiodic system. It goes on to say that it will give uniform output over a frequency range of approximately 5:1 ratio, with non-directional characteristics and without critical adjustment.

The article goes on to say that when this antenna is mounted horizontally, the polar diagram will exhibit a pronounced minima at the ends, rather like a resonant dipole. However, when it is tilted to an angle of 30°, it becomes non-directional for all practical purposes.

Naturally, I was interested in the quoted polar diagram changes below 30°. So, I'm going to do some experimental work on this aspect, and I'll report back. Watch this space!

Quoted Dimensions

The quoted dimensions of this

Fig. 3: The antenna erected and under test. The wire elements and spreaders are actually difficult to see, and have been computer-enhanced to provide an idea of scale.

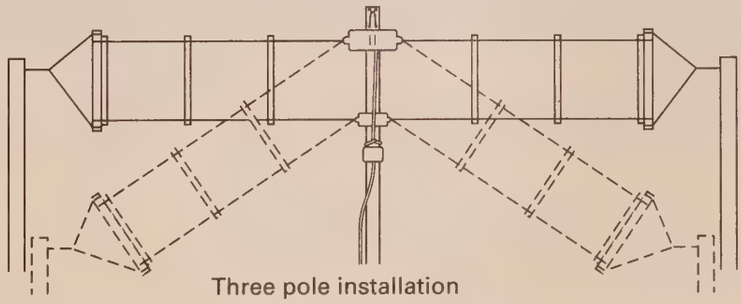

Fig. 4 (top right): (Caption on drawing)

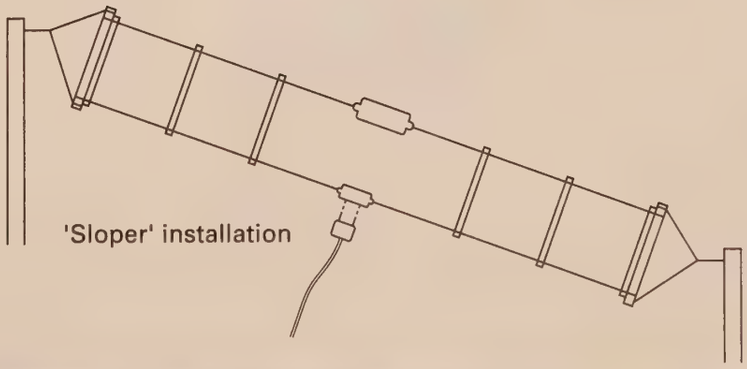

Fig. 5 (bottom right): (Caption on drawing)

antenna, for a frequency range of 3.5 to 17.5MHz, are 28m long with a spacing of 900mm. The antenna is fed with 600Ω line in conjunction with a 600Ω terminating resistor.

Whether the BWD1.8-30 is a T2FD is not possible to say, because a description of how it operates is not included in the literature. When I asked the importers, I was told that it's an improved version of the T2FD, and that it is covered by US Patent No. 4423423.

The description of the T2FD characteristics, go some way in explaining why the BWD1.8-30 antenna performs reasonably well at low heights. This is assuming that the characteristics of the BWD1.8-30 are similar to the T2FD.

The inverted V configuration I used over the house, if the literature is to be believed, is vertically polarised. Because of this, any coupling into the nearby telephone wires would be minimal.

Aperiodic Antenna

The BWD1.8-30 has the disadvantage of an aperiodic or multi-band antenna. This means that it will radiate any harmonics generated by the transmitter fairly efficiently.

Despite being aperiodic in operation, when the antenna was installed on the roof of my house, the v.h.f. radio and the TV antennas were within 2m of the BWD1.8-30's centre, I didn't notice any interference. If harmonics are a problem, a low pass filter should be used.

Another solution would be to use simple band-pass half-wave filters, one for each band. Incidentally, I'll be writing about this subject in a later 'Antenna Workshop'.

However, the fact that the s.w.r. is so flat over the frequency range means that an a.t.u. is not necessary. This can be quite an advantage if operational simplicity is required, as it would be for a disabled or white-stick operator.

Summing Up

In summing up my feelings regarding this antenna, I believe that it's a far better solution to multi-band operation than the G5RV or a multi-band doublet with tuned feeders and a.t.u. I think it's also better than the parallel dipole arrangement.

The reason I say this, is because of its good performance, for a 3.5MHz dipole type antenna, on the higher frequency bands. I also think that the BWD1.8-30's apparently low susceptibility to metal objects, such as nearby telephone wires, would be another helpful factor for many locations.

My thanks for the loan of the Barker & Williamson BWD1.8-30, go to R. F. Engineering Ltd., of Woeful Lake, Sherbourne, Gloucestershire GL54 3PR. Tel: (0451) 844237, FAX (0451) 844253, who can supply the antenna for £229.95 including VAT plus £5 carriage.

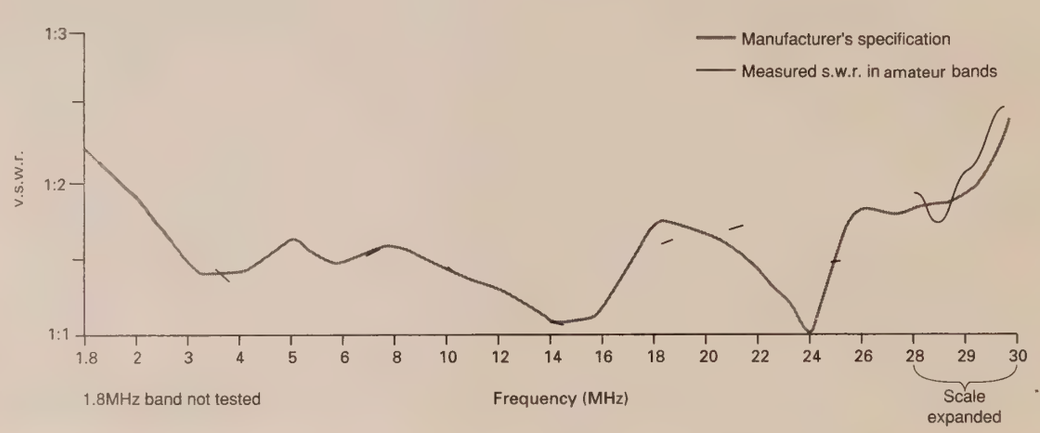

Fig. 6: Peter Dodd's graph showing v.s.w.r. versus frequency with variations (from the manufacturer's graph) on the amateur bands marked (see text).

New Home For Practical Wireless

We're moving house! As from 14 January 1993, *Practical Wireless* and *Short Wave Magazine* are moving to new offices. The new headquarters are located at Broadstone, on the outskirts of Poole.

So, as from January 14, please address all correspondence to Practical Wireless or Short Wave Magazine at: Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

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EXP14	20-15-10m 4 element Beam
TH3JRS	20-15-10m 3 element Beam
TH2MK3S	20-15-10m 2 element Beam
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14AVQ	40-10m Vertical
18VS	80-10m Vertical
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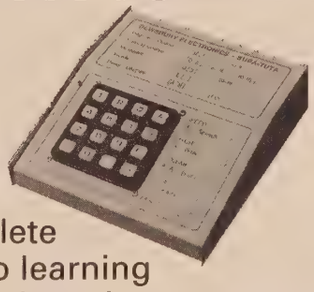

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Access

First of all, may I welcome you all to my new column in which, as the title says, I am going to concentrate on the wide range of the now vintage radio equipment designed around the various types of thermionic valves.

Valves &

Throughout my working life, customers, editors, employers and producers have periodically asked me to do something different. Therefore, if a living is to be earnt, it must be done. After all, 'he who pays the piper calls the tune' and that tune now says 'good-bye' to 'Reflections', which I hope you enjoyed reading as much as I did writing it and 'hello' to 'Valves & Vintage'.

Twixt you and me readers, it's good to know that such worthy people believe that I can change course when asked to do so. Maybe a 50-year association with many aspects of the radio industry, ranging from charging accumulators to broadcasting, has something to do with it.

Battery Operated

Apart from a battery operated electric train set at the age of seven, my first real sight of electricity at work came three years later when I was shown the complex set of relays and wiring inside the control box of a set of traffic lights. My personal 'Elmer' maintained those lights and, at that time, 1940, he gave me the parts to build a one valve wireless set.

In 1944, at the age of 13, I was lucky enough to see and tune the dials of the RAF's famous R1155 communications receiver. Also around that time, I was privileged to sit inside a Canadian tank and operate a brand new WS-19.

By the age of 14, I was working for a cycle and wireless dealer, which began my practical experience of various subjects from ball-bearings to television. In those days, most young engineers learnt their trade on the job and were involved with the service and installation of a wide range of radio, electrical and allied equipment. The incentive to gain experience was rapidly rewarded when customers or trade-colleagues asked you to carry out such work for them.

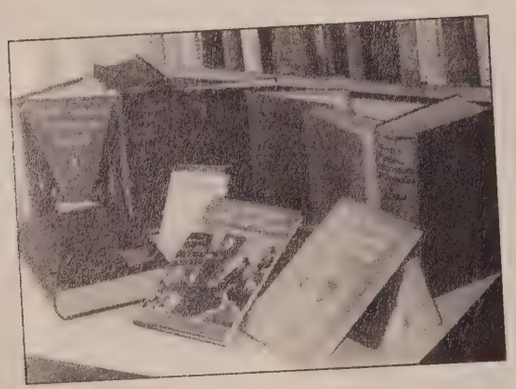

Fig. 1.

Fig. 2.

In my young days, (1931-43), a corner table in the dining room supported a Philips 'Super Inductance' wireless-set, which was only switched on and tuned by father. We heard the *One o'clock news* when he was home for lunch to turn it on. The same applied to the *Six o'clock news* and a couple of hours entertainment in the evening listening to such programmes as *Henry Hall's Guest Night*, *In Town Tonight* and *Monday Night at Eight*.

Over-night, the outside long-wire antenna was 'earthed' via a porcelain change-over switch to protect the set from possible lightning. This was typical of most families who were fortunate enough in those days to have a wireless-set.

The family receiver was known in a multitude of homes as 'father's wireless', because it was **his** and to him an expensive item. A good set cost between £9 and £12 and that amount, from an income of around £100 per annum, was a lot of money. A repair, such as a valve replacement, could cost a weeks wages. Make no mistake about it readers, wireless or radio, call it what you will, was relatively more expensive and a far greater luxury in the 1930s and 40s than it is today.

Practical Wireless

The prime object of this new column is to try and offer practical wireless help, for those of you who have an interest in the valve era and/or are keen to restore an 'old' radio set to working order. First of all, keep in mind that every piece of gear from 'father's wireless' in the living room, to the WS-19 transmitter/receiver in a tank, was built with the 'user' and thus the prospective purchaser, in mind.

Also, remember that all such equipment was manufactured with the valves and components that were available at the time. Therefore, in order to better understand the radio techniques of that era, I suggest that you watch the second-hand book shops for copies of 1930s/1940s wireless books written by F. J. Camm, **Fig. 1**, John Scott-Taggart and Alfred T. Witts.

Among my favourites by these respective authors are *Practical Wireless Service Manual* first published in 1938, *The Manual of Modern Radio* 1933 and the 1944 edition of *The Superheterodyne Receiver.* I have seen these books on shelves marked 'Electrical', 'Radio' and 'Science. On one occasion, I found a book about (wireless) 'valves' in the motoring section, hi.

However, if your interest lies with a specific piece of equipment, then try and get a service manual for it. Sources for these often appear among the advertisements in *PW* and our sister journal *Short Wave Magazine.*

Real Enemies

In addition to gradual wear and tear, heat, dust and damp are three real enemies of elderly radio equipment. Throughout their working lives, the components, both electrical and mechanical, are subjected to heat generated inside the cabinet by five or six valves and from the mains transformer or mains-dropping resistance.

This of course depends on how the set is powered. Dust is attracted by the heat, which dries up and hardens the lubrication in moving parts like control shafts, dial drives and wave-change switches and causes some cable insulation to perish.

Long storage in damp conditions can create rust in some metal parts and the breakdown of insulation in capacitors and transformer windings. On examination, you could also find the dial cord rotted, the mains lead perished and corrosion building up at resistor ends and in valve sockets.

Avoid Temptation

No matter where you find a vintage radio, be it in a relative's loft, at a jumble sale, second-hand shop or car boot sale, avoid the temptation to plug it in to see if it works. Examine it thoroughly first and look for the points I have already mentioned.

If you are satisfied with the equipments' electrical condition, then lightly lubricate the moving parts and pay special attention to the

Vintage

By Ron Ham

Fig. 5.

bearings on the main tuning capacitor, the dial drive pulley shafts and the wave-change switch. Clean the inside of the cabinet, chassis and loudspeaker. On reassembly, make sure all fixing screws inside the cabinet are tight, unless you want an annoying rattle when the speaker produces a bass note.

Be Careful

You may get tired of me saying this, but **please readers, be very careful when examining or servicing elderly sets. Lethal voltages are employed, especially around the mains transformer and rectifier and in some cases the metal chassis is at full mains potential. If you are not sure, either get proper advice from a radio engineer, or, be wise and leave the job alone.**

Live Chassis

The live chassis can be a hazard. Many domestic receivers were designed to work on a.c. or d.c. mains, because, up to about 1955, a number of districts of the UK still had a direct current (d.c.) electricity supply. Such sets were called 'universal' and the power requirements for the valves are wired in a totally different way to a set designed to work on alternating current (a.c.) only.

Special safety precautions were taken in their manufacture to insulate metal parts from the user's touch. Typical safeguards are chassis bolts recessed in the base of the cabinet and covered with an insulating material, securing screws on control knobs are inside a deep slot which was often filled with a waxy substance and special components were used to isolate the external antenna, earth and loudspeaker sockets from the 'live' areas of the chassis. All such safety precautions **must** be restored after repairs are carried out.

Valve Sockets

Obviously, the pins on a valve base must fit snuggly into their sockets to make good electrical connection with its associated circuitry. However, although the heat from long working hours may have weakened the cement securing the glass envelope to the base and the top-cap to the glass, the pins are likely to be tighter in their sockets.

Should you find the slightest movement in the top cap, don't try and force its connecting clip off. This will certainly break the cap's internal connection at glass level and render the valve useless.

Never unplug a valve by pulling on its glass envelope, because of the risk of the 'bulb' parting from the base and breaking the wire connections to the pins. Examine a valve before removal, if there is a 'white' or 'milky' looking area inside the envelope (known as soft) then the glass is cracked and weak and likely to shatter on removal.

Keep all these points in mind and always remove a valve with care and ease it out by firmly holding the base. Next time I will offer a few more servicing tips, but now let's consider another form of electromechanical equipment.

The Telephone

I would imagine that the largest number of Christmas and New Year greetings was a close run thing between a card in the post and words on the telephone. No doubt, thousands of telephone units were given as Christmas presents, especially as it is now so easy to buy an instrument to suit a users special requirements. The majority of these (make sure they are BT approved) connect to the national network via a plug and socket and transmit and receive their intelligence through an electronic exchange.

The radio-phone is now very popular, and I have frequently heard a 'ring' in the street and seen the call answered on a pocket-sized hand-unit. However, it was not so long ago that the local automatic telephone exchange was a complex electromechanical arrangement, installed in a dedicated building and the home or office telephone was a robustly constructed hard-wired unit.

Rural Telephone

Throughout the UK, there were many tiny automatic exchange buildings linking rural communities, by telephone, to the outside world. Now, thanks to the Worthing section of the Institute of British Telecom Engineers (IBTE) under the direction of David Rudram, one such exchange has been reconstructed at the Amberley Chalk Pits Museum.

The building, complete with fenced garden, in the 1930s Post Office style, **Fig. 2**, was modified and prepared for the equipment by a team of museum volunteers. Visitors, looking through the open door, can see the rack-mounted apparatus, **Fig. 3**, the back-up accumulators and the engineers tools, work-bench and chair, **Fig. 4**.

The installation is a 'Unit Automatic No. 13' with mechanical, two-motion, selectors of the Strowger type after the style first introduced by the Post Office in 1936. As originally designed, this exchange could cope with 400 lines, but at the Chalk Pits only 50 will be in use. In addition to including such items as the engineers steps, cleaning bucket, test-gear and work orders, David has connected a contemporary telephone for visitors to dial a number and see the system work.

Special Interest

I have a special interest in this telephone building because it is situated to the right of the museum's Wireless and Communications exhibition, where Joan and myself spent our Sundays and Bank holidays for more than 12 years, **Fig. 5**.

When I retired as Honorary Curator of the Wireless Exhibition, in April 1991, David Rudram, a member of the British Vintage Wireless Society, took over my work. During our years at the Chalk Pits, I met many of our readers and had the pleasure of showing them the story of communications from the electric telegraph of the 1890s, through two world wars, to remote controlled television of the 1980s.

The 90 years of technical achievement that made the world 'smaller', provided entertainment and education for the masses and almost instant all-purpose communication on land, sea and in the air.

Cheerio for now, and don't forget, I'm looking forward to your letters, news and views on valved and vintage equipment. You can write to me at **'Faraday', Greyfriars, Storrington, West Sussex RH20 4HE.**

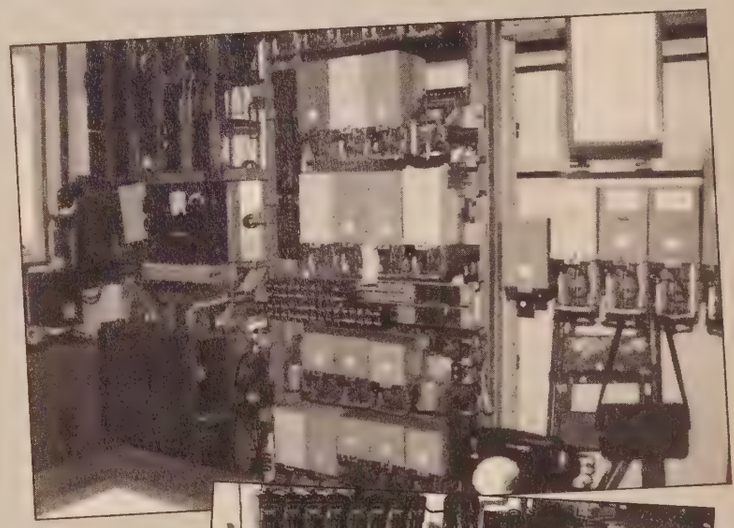

Fig. 3.

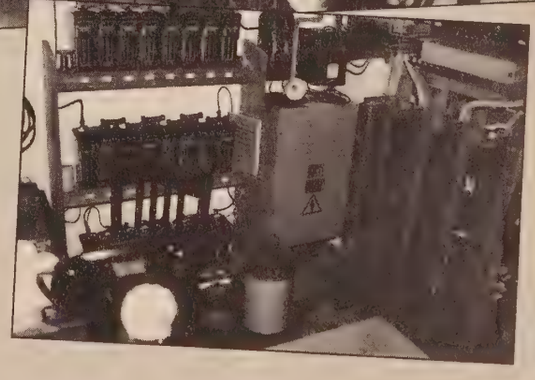

Fig. 4.

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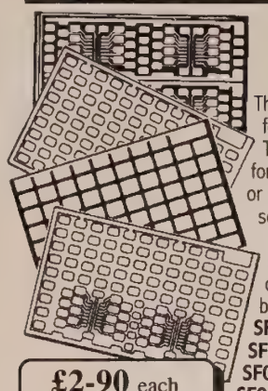

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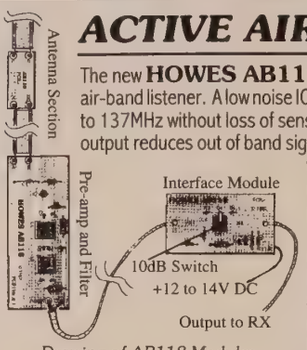
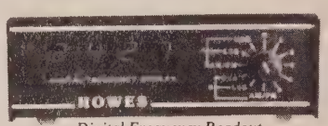


Drawing of AB118 Modules

The new **HOWES AB118** Active Antenna has been optimised for the VHF air-band listener. A low noise IC preamplifier gives excellent performance from 118 to 137MHz without loss of sensitivity at the band edges. A band-pass filter on the output reduces out of band signals to help your receiver's performance. The half-wave, end-fed antenna element is formed with ribbon cable, so it can be easily rolled up and packed for holiday use. It also fits in standard 1.5inch plastic water pipe for permanent weather resistant installation at home. The total antenna length is 1.65M. The **HOWES AB118** gives excellent air-band performance that will help pull in those more distant signals from both home and portable locations.

Kit: £17-70 **Assembled PCBs: £24-70**

Add-on Digital Readout!



Digital Frequency Readout

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DFD4 Kit: £39-90 **DFD4 Assembled PCBs: £59-90**
PMB4 Kit: £9-90 **CA4M Hardware: £19-90**

Some kits from the range:-

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DXR10	10, 12 & 15M SSB/CW Receiver	**£26.60**	**£39.90**
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TRF3	TRF Shortwave Broadcast receiver (for junior op?)	**£15.50**	**£21.70**

PLEASE ADD £1.50 P&P for kits & boards, or £4.00 if ordering hardware.

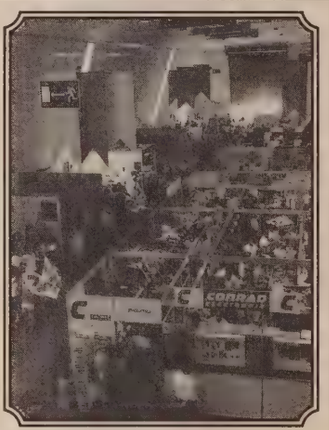
HOWES KITS are produced by a professional RF design and manufacturing company. They contain good quality printed circuit boards with screen printed parts locations, full clear instructions and all board mounted components. Sales and technical advice are available by phone during office hours. Please send an SAE for our free catalogue and specific product data sheets. Normally all items are in stock and delivery is within seven days.

72 & 73 from Dave G4KQH, Technical Manager.

FRIEDRICHSHAFEN

Visit Europe's biggest radio show for just £249.75

Our first coach trip to Friedrichshafen this year was so successful that we are repeating it again next year. Now you can take part and enjoy four nights at the best hotel in Friedrichshafen, a 3 day ticket to the show and free excursions to the Black Forest.



Every year Friedrichshafen hosts Europe's largest amateur radio show and our reasonably priced trip will let you to travel there in comfort on a luxury coach (equipped with toilet, coffee machine and video), stay in a quality hotel and visit the Black Forest. We'll pick up passengers from Victoria Coach Station early in the morning on Thursday the 24th of June and then drive to Dover and catch one of the first ferries across. We'll arrive in Friedrichshafen late that evening (no overnight travel!) and then spend 4 nights at the Buchorner hof Hotel. *It is worth mentioning that the rooms in this hotel are doubles, that is really doubles not twins – they have double beds.* This means that ours trip is more suitable for couples, so to encourage wives and/or girlfriends to come along there are a couple of day excursions on the Friday and Saturday.

The complete trip – coach travel, ferries, all tolls, 4 nights accommodation (with breakfast and evening meal) and excursions – costs £249.75 (based on two people sharing) and there will be a few single rooms available for a supplement.

It will help me with booking rooms if you can let me know as soon as possible if you are seriously interested in going as so few places are available and last year we had a waiting list. If you want to know more you can usually contact Roger Hall G4TNT on 071 731 6222 during office hours or by writing to me at P.O. Box 948 London SW6 2DS.

practical Wireless

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Ferguson 461 Hacker RV20, Mullard Mas 3, Philco 10352?, Phillips types 1410 and B3G75U, Pye T19D, Roberts 20802?, R1392 clone, collector's /vintage radio's needing attention, £250 o.n.o. cash only, buyer collects. Dave. Tel: (0298) 71225 evenings after 6pm.

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Hokushin 5 band vertical, £135. Butternut h.f. mini beam, £120. Tokyo 144MHz - h.f. transverter, £165, o.v.n.o,. 40W out. All g.w.o. buyer inspects, collects. Tel: (0285) 650656.

Kenwood TH-215E 144MHz hand-held, 144/146MHz 5W, memories/scan keyboard entry. Also BC-7 rapid charger, s.w.r./power meter all absolutely mint. Boxed with instructions used few times only at base. £185. G2FZU, QTHR, Southwell, Notts. Tel (0636) 813847 no offers please.

Panasonic RFB-65 receiver boxed v.g.c. (similiar to Sony ICF7600) 36 memories, scanning b.f.o. broadcast f.m., £90. Alinco DJ-560 extended receive CTCSS, DTMF c.w. speaker mic, NiCad, charger, manual, v.g.c., £250 Ian G1HQK. Tel: (0354) 660800.

Ten-Tec Century 22, mint condition, IR£310 (Irish Punt). SEM audio multi-filter, as new, IR£75 (Irish Punt). No telephone, so write to Noel Cameron EI4DZ, 16 St Mary's Crescent, Westport, Co Mayo, Eire.

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Wanted

Attention FT-227R/RB owners! Two mobile brackets needed from packet radio/base station users and front wire support needed from mobile user. Circuits R & RB plus any dead rigs for spares appreciated. Keith G0OZK, 10 Basil Street, Stockport, Cheshire SK4 1QL. Tel: 061- 477 5303.

Eddystone models EC10 EB35, 870 870A, and all variants of above for cash. May be able to collect. Mr Lepino. Tel (0372) 454381 anytime.

Minimaster 3 (2 + 10) telephone system manual and/or circuit diagram. Also two MO79BI, plastic or M079FI, ceramic. Integrated circuits needed urgently for above, all expenses paid. Gordon G3NTA, QTHR. Tel: Whitby (0947) 602975.

Mizuho MX2 144MHz working 144MHz s.s.b/c.w. transceiver. Will pay fair price and postage. Tel: (0677) 423349.

Plessey PR 155 module no. 11, working or not, but complete. Need at least a schematic of this 10.6-10.8 oscillator, and better the manual or copy. Have manuals for PR1551 and 1553. Dr. A. Guiriec, Biologie-Hopital du Porzou, 29900 Concarneau, France.

Six metre module and Yaesu SP-102 speaker and Yaesu MD-1B8 base station microphone for Yaesu FT-726R tri-bander contact 2E1BCF (John), 17 Fell View, High Spen, Rowlands Gill, Tyne & Wear NE39 2BW. Tel: (0207) 542194.

Yaesu FT-200 any repair information wanted, Buy, copy or loan. All expenses paid. G4OTM, QTHR. Tel: 061-678 0684.

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Toyo T-435 thru-line wattmeter 144/435MHz model Toyo T-435 for **s.w.r./p.w.r meter** covering 50/150MHz i.e. 3.5/150MHz or will buy. Robin GW1AHU, Gwent. Tel: (0291) 420506.

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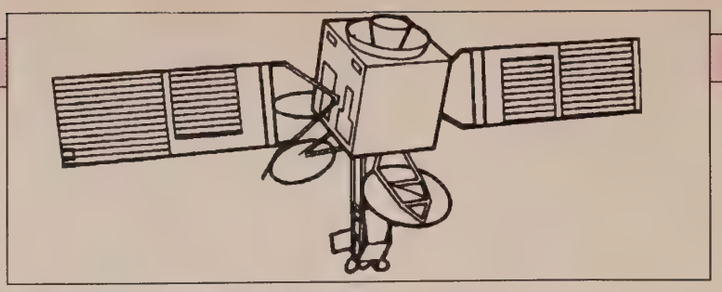


Satellite Scene

by Pat Gowen G3IOR

In response to readers' requests, this month Pat Gowen G3IOR reviews the operational status of the presently active amateur radio satellites, and gives a few tips on using them to best effect.

OSCAR-10 Downlink

Signals from OSCAR-10's 145MHz downlink monopole antenna are excellent at times. With no command capability, the satellite is permanently on 'B' mode now, unless poor sun angles dictate a low battery, when it goes off. There are few users for OSCAR-10 compared with OSCAR-13.

Heavy Workload

The extremely heavy workload at the University of Surrey has rather taken attention away from the uploading and command of OSCAR-11 for several months. Now ex-AMSAT President Doug Loughmiller KO5I has joined the UoS team, so the programme will start up again and loading of the bulletin board with the latest news will become a regular feature. The satellite appears to be in excellent health, and its 145.825MHz signal is heard on a regular basis.

Radio Sport RS-10/11

The Radio Sports RS-10 on 'A' mode is on 24-hours per day and every day with total reliability. More stations use this in Europe than all the rest of the satellites put together. The recently lowered m.u.f. has meant a far stronger downlink at low elevation angles, with few problems from the many terrestrial f.m. stations that invade the downlink passband.

The early November to end of December m.u.f. rise gave some excellent antipodal downlink reception, and John Branegan GM4IHJ reported a very unusual hearing of the 29.357MHz RS-10 beacon when the satellite was over South Africa.

In Reserve

The Mode K only, 21MHz up, 29MHz down, is available on RS-12 all-day and every day whilst RS-13 is being kept in reserve. Most stations heard on the downlink are using 21MHz via F2 rather than the satellite. In these winter and early spring months when the m.u.f. is well up, sub-horizon tests with many participating Gs and Ws and ZL3GQ take place.

Andy Mirinov RK3KPK, who attends the RS3A command station for the current RS satellites with Leo Labutin UA3CR, may soon now be putting RS-12 or 13 into mode KT for specially selected periods. The 'KT' mode gives both 21MHz and 145MHz downlinks from a 21MHz uplink. This is being planned on the Wednesday experimental days, when selected satellites with matching uplinks and downlinks can 'see' each other across space to enable G4CUO's experimental 'DOHOP' (Double-Hop) work.

The idea is to transmit to say RS-12 or 13 on 21MHz, have the resulting 145MHz output go across space to either FO-20's or RS-14's 145MHz input, then to be put out again at either 435 or 29MHz, so linking two or more satellites. This link would permit considerable extension to the usual limits and provide some dual Doppler rate findings.

OSCAR-13

All OSCAR-13 devotees will be happy to know that OE1VKW Viktor Kudielka's prediction calculations on the failing orbit have been borne out in practice. The last few sets of Keplerian elements have shown that OSCAR-13's perigee is now on the way up again.

Performing Well

Despite the radar problem, OSCAR-13 is performing well. At the times when the antenna pointing is favourable, surprisingly strong signals have been heard. Many new DX stations have been coming onto the satellite.

The ESDX and many individuals contacts report recent current and future activity from Mongolia by Ron JT/K7HDK (QSL KL7GRF), Rosemond J69BB from St. Lucia (QSL QTHR), OH1AF/OJ0 from Market Reef (QSL OH1NOA for c.w. or OH1EH for s.s.b. QSOs), Aaland Island OH3TM/OH0 by Alpo (QSL OH3TM), Djibouti by J2/WD3Q, FP/VE1KM from St. Pierre (QSL VE6LQ), 9A3QK in Croatia, Saudi Arabia by Dane 7Z2AB (QSL AA0BC), V73IO/AH6IO and V73UY/NH6UY from Bikini Atoll (QSL the home call e.g. NH6UY QTHR), JD1/JJ1ZNF/P from Minami Torishima activated by Kuruja JJ1ZNF (QSL JM1Xc.w.), Z21ZE Zimbabwe by JA8CDG (QSL JA1UT). Vidi, VU2DVP and XYL Chitra VU2CVP came up from the Laccadive Islands with an outstanding signal in November. Their QSLs go via OZ1KYM.

Expected shortly are A41JT and A45ZO with A6 prefixes from the United Arab Emirates, PJ7 Dutch St. Maarten and FS7 French St. Martin by Jaap, PJ2CU, J7 Dominica by Wolfgang DL5MAE. Plans are in hand for VK9X, Christmas Island by Paul KF6TC, future UH8 operation by Vlad UM8MM, 5Z4 Kenya by Gerard F2JD, XU Cambodia by John PA3BTQ and 5R8 Malagasy by Eric WD3Q. Sounds more like a listing from 14MHz in peak sunspot times, doesn't it?

Mode Change

Although Leo Labutin wrote to me that a mode change of RS-14/OSCAR-21 was soon due, it has continued to run its RUDAK's DSP/RISC f.m. transponder throughout November. At the time of writing it is still giving a continuously repeating 10-minute cycle consisting of one minute of 400 baud p.s.k. telemetry transmission, followed by nine minutes of DISP f.m. transponding, producing a very popular 'flying f.m. crossband repeater'.

Uplinks Tests

Uplink tests of the different uplink powers necessary to effect fully quieting access were carried out when the -12dB attenuator in the receiver uplink was commanded in and out. At full satellite receiver sensitivity, when the radar QRM and other amateur QRO was absent, I was able to QSO DB2OS running only 1W, and work W stations with the satellite at my extreme western horizon.

User Reminder

Users need a reminder that the f.m. crossband 435.016 to 145.987MHz 'repeater' can carry only **one** transmission at any one time. As RS-14/OSCAR-21's line-of-sight path (footprint) covers many thousands of square miles, the number of potential users when over highly populated amateur areas like Europe are enormous.

Thus, brief QSOs are necessary at busy times in order to give all stations, particularly hand-portables and mobiles, the opportunity of a QSO. Low power stations are advised to experiment with low population density on passes close to overhead late at night or in the early mornings.

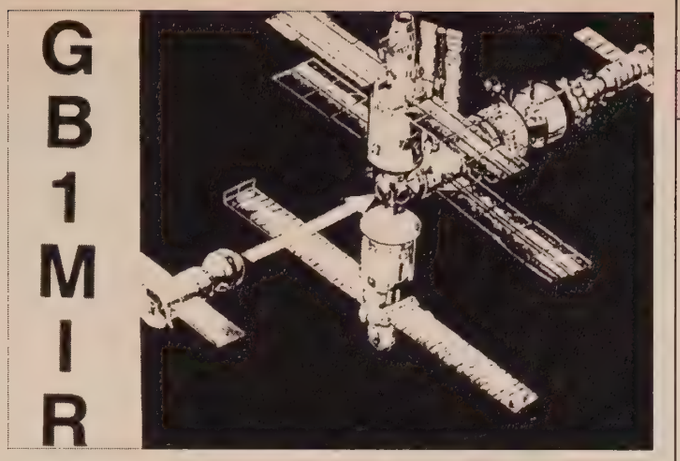
Whilst cross-polarised high gain antennas can effect excellent quieting, it is easy to lose the satellite if one off-points the beam, so some 50 or so watts to omni-directional antennas, such as crossed dipoles (turnstiles), can prove more effective in the long-term. Using high-power to produce the normally advantageous f.m. capture effect, can prove counter-productive, as the -12dB attenuator automatically switches in if the transponder is over-driven. This takes virtually everyone out. The lesson to be learned is to keep your power down to that minimum quieting level necessary, or you won't work anyone!

The RS-14/OSCAR-21 seems poor at times of low angles of elevation, and it's thought that its 435MHz uplink helical footprint is far narrower than the 145MHz downlink antenna. This is also narrower than the line-of-sight angle to the satellite. The satellite also exhibits a slow polarisation roll, so RHCP is recommended.

In Europe 'alligators' abound, but at high elevation angles 10W mobiles and portables can get in (although not fully quieting) when the QRO stations lay off. At times, particularly when in the north eastern sky, the transponder seems enormously noisy, and even 1kW e.r.p. cannot provide readable transponder output.

It is believed that the PAVE PAWS radar stations in Europe and the UK, which have been placed into the 435MHz amateur satellite band, are the main cause of this particular problem.

Pat Gowen G3IOR, almost (but not quite) in orbit!



Helen Sharman's QSL card.

New Software Loading

The new software loading to OSCAR-16 was completed by November, so users can now use the same 'PB' and 'PG' programs as they do for OSCAR-22, which include the directory broadcast. The Raised Cosine (RC) transponder is in use, with its downlink frequency on 437.050MHz. Jim White WD0E recommends that RHCP (Right Hand Circular Polarisation) antennas are used for best results.

The DOVE

The DOVE-OSCAR-17 is still not fully operational even after all this time. Its software is still being reloaded, the 145.825MHz downlink is off, but the S-Band downlink is on.

WEBERSAT

Imaging continues as usual on the WEBERSAT-WO-18, and the current transmitter is still on 437.1040MHz using the RC TX.

Lusat Transmitter

The raised cosine transmitter is in use on Lusat Oscar-19, 437.1255MHz. For broadcast downloads PB.EXE version 910509m program is recommended by LU8DYF, and for the directory and file uploads PG.EXE version 910207r. The broadcast bulletin is active on Mondays.

Inverting Wednesday

Fuji-OSCAR-20 is now in its 145.900-146.000MHz 'JA' mode c.w. and l.s.b. uplink with inverting 435.900-435.800MHz u.s.b. downlink every Wednesday. It's on the 435.795MHz digital 'JD' BBS mode at all other times.

Due to the infrequency of appearance, very few users have been noted. At times, the only signals to be heard on the analogue mode have been stations in Europe illegally using the 145.800-146MHz space band for terrestrial f.m. QSOs!

We are hoping to get more 'JA' time, as Dave Rowan G4CUO is anxious to progress with with his 'DOHOP' experiments. He needs such transponders as FO-20 on to give the 145 to 435MHz signals to pass across to AO-10, 13 or 21 (RS-14) then to take back to 145MHz.

OSCAR-22 Busy

The BBS is operational and is very busy indeed on OSCAR-21, and is now passing lots of traffic at high speed. Packet radio messages that have been known to take up to six weeks to reach the USA by the h.f. mailboxes, are arriving at their final destinations within two days when OSCAR-22 is employed. This popular use has produced complaints by those attempting to download files and pictures.

SARA Heard

The SO-23 'SARA' satellite is being heard, often listened to when both in and out of range of Jupiter, when there appears to be no noticeable changes in it's telemetry. SARA appears to send '88s' most of the time. Whilst 88s from a French YL called SARA are stimulating, it doesn't do much for those who would wish to follow the amateur experiment!

Korean Command

The KITSAT-1 satellite continues to have its loading accomplished from the Korean Command station. Image file downloading continues, one of which shows an excellent cloud-free picture of the coastline of Burma, Laos, Thailand and Bangladesh.

The University of Surrey control are arranging that picture and BBS use do not compete. The Digital Signal Processor is working, as for a few days we heard it playing military style music!

Awful Mix-Up

An awful mix-up resulted soon after the August 10 ARIANE multiple launch of TOPEX/POSEIDON, S80/T and KITSAT-1. This occured because NORAD/NASA produced sets of Keplerian elements for each of the launched object numbers, but sadly not the right numbers for the right satellites. They assigned Cat. No. 22077 to KITSAT-1, which stands, as after the error was identified, they put the KITSAT-1 Keplerian elements into that set.

Further confusion resulted when the correct drag factor of zero went into the KITSAT element sets, as this was a predicted and not a measured level. Thus, many trackers thought KITSAT to be 'off' during calculated pass times. Set 220877 must be used, and not 22079 as given.

Both the uplink and downlink frequencies were found to be 10kHz lower than supplied, the spacecraft's callsign changed three times in 10 days, and yet a further complication arose when someone decided to start to call KITSAT-1 by the name of 'OSCAR-23', which rightfully belonged to SARA.

OSCAR Numbering

No one in AMSAT is officially 'in charge' of OSCAR numbering. It has automatically been the case that up to now that (with the singular exception of the 'RS' series) each amateur satellite, once in orbit and internationally available, would have its original 'ground' name changed to the next serial OSCAR number.

The term 'OSCAR' is merely an acronym for 'Orbiting Satellite Carrying Amateur Radio', and although RS-1, 2, up to 12 and 13 maintained their own individual identities, the latest joint Russo/German co-operative venture is known as both RS-14 (it's callsign) and OSCAR-21.

With the method mentioned, the last University of Surrey satellite became UO-22 (OSCAR-22) and the following French BELAMSAT SARA became SO-23 (OSCAR-23), KITSAT-1 is being mistakenly called 'OSCAR-23' also. No problem really!

Remember the words of the great bard who wrote in 'Romeo and Juliet' "...What's in a name? A rose by any other name smells just as sweet!". If we ALL assure the 'SO' and 'KO' prefix, and refer also to the ground names as being 'SARA' or 'KITSAT', little confusion should result in future mixing of Keplerian element data and information.

Little Activity

Very little activity came from MIR for a long time after visiting cosmonaut Michel Tognini F5MIR left the space station, after a week of hectic amateur radio effort. For many weeks, only the occasional burst of packet was heard.

The reason was that the cosmonauts were very busy installing the new 'SOFORA' stabilising boom to permit them to carry out their X-ray and visible photographic work. This demanded a lot of time and power, and left little of either for running the on-board amateur radio experiment.

In mid-October, VE7DOX suddenly heard U6MIR over British Columbia, and it has been all-systems-go since then. In November, on both packet and speech, Anatoly was heard daily on 145.550MHz.

I made a couple of good voice QSOs, at the same time as I was watching MIR go over me as a bright star as we chatted. Ray Soifer, operating from my QTH as G0/W2RS, made a good QSO, and many readers report having made packet connects.

Crimea Relays

Nico Jannsen PA0DLO, reports that 143.625MHz MIR to ground f.m. link with the ground station at Yevpatoriya on the Crimea which relays the voice, telemetry and even packet radio signals to the Control Centre TsUP in Kaliningrad, is now only being heard over Europe. Due to funding cuts, the ships that were relaying MIR signals to TsUP in the past, are no longer operational.

When out-of-range of the CIS ground stations, MIR communications are often relayed through 'Luch' or 'Altair'. These are a transponder system 'Sputnik ReTranslator' (SRT) for voice, telemetry and television, built into a geostationary communications or television relay satellites, similar to the way the RS amateur radio transponders have been built into the COSMOS satellites.

The mainly used 'SRT' in our region is in a geostationary satellite at 16° west longitude listed as 'ZSSRT-2', an abbreviation for the Russian words for 'Western geostationary satellite transponder'. There is also an eastern SRT situated at 167° east (193° west) longitude, probably located in 'Gorizont' 'Raduga' or 'Ekran'.

Although 'officially' listed at 10.835GHz, the SECAM colour television signals from MIR are relayed through the western SRT at 10.829GHz, using right-hand circular antenna polarisation. As the satellite antennas are pointed towards Yevpatoriya, the signals are not very strong, so a dish of at least 1.5m diameter is required.

Voice signals from MIR's voice signals can be found near the same frequency on a 300kHz sub-carrier with s.s.b., but only when no television signals are being relayed. When there is television, the voice signals are probably encoded in the video signals, but this is still under investigation. Also, other frequencies may be involved, but if so, these have not been found yet.

To help point your antenna at the satellite, you may use the strong 11.4GHz telemetry signal from the geostationary satellite involved.

Helen's Card

Finally, our photo shows Helen Sharman's QSL card, now out for QSOs with her GB1MIR week-long mission. It shows the now well built-up MIR, with all modules and an approaching SOYUZ manned ferry coming in to dock.

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EABC80	1.95	EY51	3.50	QQV02-6	19.50	6BA7	5.00	6X4	3.00
EB91	1.50	EY86	1.75	QQV03-10	5.00	6BE6	1.50	6X5GT	2.50
EBF80	1.50	EY88	1.75	QQV03-10 Mull	15.00	6BH6	2.50	12AT7	2.25
EBF89	1.50	EY500A	3.00	QQV03-20A	25.00	6BJ6	2.25	12AU7	2.25
EBL31	12.50	EZ80	1.50	QQV06-40A Mull	40.00	6BN6	2.00	12AX7	3.00
EC91	6.50	EZ81	1.50	QV03-12	10.00	6BQ7A	3.50	12AX7A GE.	7.00
ECC33	7.50	GY501	3.00	R18	4.00	6BR7	6.00	12BA6	2.50
ECC35	7.50	GZ32	6.50	R19	3.00	6BR8A	4.00	12BE6	2.50
ECC81	2.25	GZ33	4.50	SP41	6.00	6BS/	6.00	12BH7A GE	6.50
ECC82	2.25	GZ34 GE	7.50	SP61	4.00	6BW6	4.50	12BY7A GE	7.00
ECC83 Siemens	3.00	GZ37	4.50	U19	10.00	6BW7	1.50	12E1	20.00
ECC85	3.50	KT61	7.50	U25	2.50	6BZ6	2.50	12HG7 12GN7	6.50
ECC88	4.75	KT66	15.00	U26	2.50	6C4	1.95	30FL1/2	1.50
ECC91	2.00	KT66 GEC	35.00	U37	7.50	6C6	3.50	30P4	2.50
ECF80	1.50	KT77 Gold Lion	P.O.A.	UA8C80	1.50	6CB6A	3.00	30P19	2.50
ECH35	3.50	KT88	15.00	UBF89	1.50	6CD6GA	5.00	30PL13	1.50
ECH42	3.50	N78	9.00	UCH42	4.00	6CL6	3.75	30PL14	1.80
ECH81	3.00	OA2	2.70	UCH81	2.50	6CG7 GE	5.25	300B(PR)	120.00
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ECL86 Mull	2.50	PC97	2.00	UL41	10.00	6DQ5 GE	12.00	811A	18.50
ECLL800	25.00	PC900	2.00	UL84	2.00	6DQ6B	9.50	812A	52.50
EF37A	3.50	PCF80	2.00	UY41	4.00	6EA8	3.50	813	27.50
EF39	2.75	PCF82	1.50	UY85	2.25	6EH5	1.85	866A	25.00
EF40	5.00	PCF86	2.50	VR105/30	2.50	6F6	3.50	872A	20.00
EF41	3.50	PCF801	2.50	VR150/30	2.50	6GK6	4.00	931A	25.00
EF42	4.50	PCF802	2.50	Z759	35.00	6H6	3.00	2050A GE	10.00
EF50	2.50	PCF805	1.70	Z803U	25.00	6HS6	4.95	5763	10.00
EF54	4.50	PCF808	1.70	2D21	3.50	6J5	3.00	5814A	4.00
EF55	3.50	PCH200	3.00	3B28	20.00	6J6	3.00	5842	12.00
EF80	1.50	PCL82	2.00	4CX250B EIMAC	62.00	6J7	4.00	6080	8.50
EF85	1.50	PCL83	3.00	5R4GY	6.00	6JB6A GE	15.00	6146B GE	15.00
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EF91	1.95	PCL85	2.50	5V4G	4.00	6JS6C GE	11.25	8883B GE	16.00
EF92	2.15	PCL86	2.50	5Y3GT	2.50	6K6GT	3.00	8973	11.00
EF183	2.00	PCL805	2.50	5Z3	4.00	6K7	4.00	7025 GE	7.00
EF184	2.00	PD500	6.00	5Z4GT	2.50	6K8	4.00	7027A GE	12.50
EH90	1.75	PFL200	2.50	6/30L2	1.75	6KD6 GE	11.95	7199	10.00
EL32	2.50	PL36	2.50	6AB7	3.00	6L6G	8.50	7360	25.00
EL33	7.50	PL81	1.75	6AH6	4.00	6L6GCSYL	9.50	7581A	12.00
EL34 Philips	10.00	PL82	1.50	6AK5	4.50	6L6GC Siemens	4.50	7586	15.00
EL34 Siemens	6.00	PL83	2.50	6AL5	1.00	6L6GC GE	9.50	7587	23.00
EL36	4.00	PL84	2.00	6AM6	1.95	6L7	3.50	7591A	10.00
ELL80	25.00	PL504	2.50	6AN5	5.00	6LQ6	12.50	7868	10.00
EL81	5.00	PL508	5.50	6AN8A	4.50	6Q7	4.00	8068	15.00
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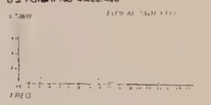

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Versatility is excellent. The AR1500E may be powered from it's internal NiCad pack, spare dry batteries may be carried for extended operation and used with the dry battery case, the set may also be plugged directly into the cigar lighter socket of a motor vehicle (external input range 11 - 18V DC).

Although offering a long list of facilities and operating modes, the receiver remains easy to operate. Many facilities have been carried across for the well proven AR2000 receiver. The AR1500E has an `automatic memory' feature which automatically stores busy channels from search bank 9 into the 100 memory channels of scan bank 9.

There are 1000 memories in total arranged in 100 memories x 10 banks, there are also 10 additional programmable search banks. Each memory will store frequency and mode (NFM, WFM or AM - not SSB) the search banks will also store the step increment. There is a massive EEPROM memory store for all memories and search banks so that no backup battery is required. The memories may be over-written time and time again. The display often provides `prompts' for selected operations such as a flashing "CH" to invite the user to key in a new memory channel number. All information such as frequency, mode (except SSB), channel etcetera is presented via an easy to see Liquid Crystal Display (LCD). The display is fitted with a switchable light to increase visibility in areas of low level lighting.

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PACKET PANORAMA

This month, Roger Cooke G3LDI, brings you good news about the changes to his column, before introducing the first of the packet user groups.

The Pac-Comm TNC-220 is a widely used in v.h.f./u.h.f. packet TNC, and is snapped up quickly when found on the second-hand market.

Let's start with the good news that 'Packet Panorama' **is going to appear every month**. The sad news is, that there's only space for one page. Please start sending all your information in again so I can let the other readers know about what you're doing.

Packet Groups

I recently had a letter from a newcomer to packet radio, saying that he's had difficulty contacting his local packet group. He felt that it was almost impossible to become a member of a group he knew nothing about.

I'm therefore going to give details of packet groups from various areas, not only for the benefit of the beginner, but for everyone. I hope this will provide information for the would-be user, and hopefully, encourage users to join their local group.

Please send details of your local packet group to me, and I will publish them as I receive them.

Let's start the ball rolling with the SUNPAC group.

Southern Group

The **S**outhern **U**sers **N**etwork **PAC**ket group covers the central south coast area - roughly Poole (SW) to Chichester (SE), Blandford (NW) and Salisbury-ish (N).

The group's officers are:
Chairman: Dave G4WPT/GB7BNM
Secretary: G0AFF/GB7HJP
Treasurer/Member secretary: Jim G6FPC/GB7SIG

The purpose of the group, is to maintain and develop the network in their area with the collaboration of many individuals, who supply their own time and usually their own equipment. To cover the costs of unattended sites, they have a membership subscription of £3 per annum.

The group produces useful items of documentation, including BBS and network guides. They also hold many disks (IBM PC) containing useful software (shareware and public domain) and files.

The above information was kindly sent by the chairman, Dave G4WPT, and he can be contacted on packet, as G4WPT @ GB7BNM. Don't forget, send details of your local packet group to me, via any method, and I will publish them as time and space permit.

Strange Article

Some of you may have read the article, in the September issue of *RadCom*, by Colin Richards 9M2CR. It really is strange that this article, with views **against** h.f. packet, should be published at such a late date. I've had this article on disk since 1987, the days when h.f. packet was really struggling to justify its presence.

Since then, of course, we have become much more organised. Nets on h.f. have maintained themselves in such a way that computer controlled QSY, and frequency hopping, has become the norm. Restriction of forwarding assures that the noise level is at a minimum and other goodies, such as 1200baud p.s.k., is extensively used.

Perhaps if the RSGB would adopt a more positive attitude toward h.f. digital modes, such as helping to sort out a bandplan, some progress might be made toward better h.f. efficiency. I might even get an acknowledgement to my submitted (suggested) h.f. bandplan!

Valid Points

Having said all this, Colin has some very valid points in his article, which we discussed at length while he was in Europe. I agree that it is not really a suitable chat mode. In fact it's used less for this as time goes by. However, with the proper selection of parameters, h.f. packet works well, when using a frequency clear of the deliberate interference that has manifested itself in the past.

Since Colin wrote his article, PACTOR has appeared as another digital mode. It's also becoming very popular on h.f. Judging by the time it took for Colin's article to be published, I should receive acknowledgement of my suggested bandplan by the year 1997!!

Israeli Techsat Project

Jim 4X1RU, and I met at this year's Amsat Symposium, where we had a long chat over lunch. We are both members of HFNET, operating on 14/21MHz and are both interested and involved in Amsat operations. Jim tells me that he is now working part-time on the Israeli Techsat project.

Techsat is the Israeli Pacsat project, which is primarily an experimental platform for space research. Jim is responsible for the integration of the onboard computer and communications channels, plus the ground command station. The launch is planned for July 1994, on an Ariane rocket from Kourou, French Guiana. This new job, along with the work Jim does on h.f. forwarding, and maintaining other links, looks like keeping him very busy.

That's about it for this month. Don't forget that 'Packet Panorama' is still monthly, so get communicating and let me have your news, views and ideas.

I'm QTHR for 'snailmail' or on packet as 'G3LDI @ GB7LDI'

73 and happy packeting de Roger G3LDI.

PACKET PANORAMA

FOCAL POINT

The World of ATV

Andy Emmerson G8PTH

Greetings at the start of a new year and here we are back on schedule with the amateur television activity round-up of the past quarter.

First letter out of the file comes from **Les Huntley G4LW** in Trowbridge, Wilts. He writes: "I have just joined the BATC again after being absent since the early 1970s. I have nothing on air yet but will make a start with 70cm monochrome transmissions and maybe later 23cm colour." Les continues that he was active back in the 1960s when he and the late Cyril Chivers used to send 405-line picture across town. He was first licensed in 1939, so that's not bad going.

Another person who's been involved in ATV for more years than many, is **Gordon G3LEE**. He gets a name check in *Der TV-Amateur*, the German ATV club's magazine. Yes, it's 25 years ago that Mancunians G6LEE/T and G6ACW/T (note the old-style /T callsigns for television operation - you needed a separate licence then) made the first amateur PAL colour transmission in Europe. The date was 18 April 1968, beating the Germans: DL2OU in Bergkamen sent PAL signals to DC6MR in Dortmund two months later on June 16.

Gordon writes: "Fancy the German magazine remembering the first PAL transmission! It was between me and Tony Jacques G3PTD. I borrowed the early Philips colour bar generator from you-know-where (well, yes, I do) and Tony transmitted to me. I had the giant ex-GEC EDT5 colour receiver which I had modified from British NTSC. Now there's a blast from the past: British NTSC was on 405-lines with a 2.77MHz sub-carrier)."

And another letter from Manchester, from **S. Shannon G0NCJ**. "I read with interest the ATV columns written by yourself in *Practical Wireless* whenever I get a chance to do so and the pressures of work permit. During the past few years I have become increasingly interested in the world of ATV from listening to the talk-back frequency used by a group of ATVers in the Manchester area. The said group send each other pictures (fast scan) somewhere in the 1296MHz band, and there is also some activity in the 70cm band.

"I have recently acquired an old Microwave Modules receive converter to enable me to view TV activity on 70cm, but I am currently building a beam antenna for this band, so have not as yet been able to receive any pictures.

"Anyway, to the point of this letter. It has been brought to my attention that it is possible to receive pictures on the 1296MHz band via an average satellite TV receiver as many of these tune this frequency without modification. I am the owner of such a receiver (Amstrad SRD400) and would very such like to use this to tune the 1296MHz TV allocations. Could you possibly advise me as to whether this information I have been given is correct, and whether it is possible for the Amstrad units to cover this frequency? I would very much appreciate it if you could advise me, as I don't possess a specification manual for this piece of equipment.

An idea for a future article in 'Focal Point' would be information on exactly what equipment is necessary to enable one to get going in ATV, and also where to purchase this equipment from. Over the last couple of years or so, since I have taken an interest, I can honestly say that I have never seen any advertisement in *PW* (or any other amateur radio publication) of stockists of this kind of gear. I really think an article of this kind would be appreciated by all would-be and existing TV enthusiasts alike and would, I am sure, help promote more interest and use of ATV.

This kind of letter is a little disappointing, because I wrote two articles on exactly the subject Mr Shannon is asking about, namely a beginner's guide to starting ATV. It was published in *PW's* sister publication *Short Wave Magazine* in two issues last summer, and I too was sure it would help all would-be and existing enthusiasts! Oh well... As for the query about using satellite receivers from 24cm ATV reception, I can confirm that G0NCJ's Amstrad is an average satellite receiver and it is therefore suitable - as long as you use plenty of pre-amplification. Ideally, you need a mast-head pre-amp and another one in the shack; this is because the satellite receiver is expecting a strong signal 27MHz wide, and a weaker and less widely deviated ATV signal is not going to make much impression un-aided.

The letter illustrates another point too. I get quite a few letters which ask for a personal reply but with no stamped addressed envelope enclosed. Those letters do get answered, but only in the column, and enquirers seeking more personal attention to their letters might consider enclosing a s.a.e. (and writing on the back of a £5 note if the matter is urgent!). Only joking about the £5 note!

Did you remember to watch out for the ATV activities in connection with the Scouts JOTA (Jamboree on the Air)? **John Norris G4JEN** in west London did, and writes: "You may find the enclosed very grainy pictures of use in one of your ATV features. They were received on Saturday October 17 on a de Graaf D51 TV, fed from a 10-element Group A Yagi 20m above ground level pointing at Crystal Palace (which is 16km SE of my location). The antenna is definitely not rotatable, as it feeds a CATV system to 15 other households.

The pictures are from the JOTA station GB2OST (Oxted Scout Troop) 20km SSE of me. They were running 40kW e.r.p. from a site 245m above sea level, located just inside the M25 on the Surrey/Kent border.

I'm sorry there are no pictures from GB2BT from the London Telecom Tower. Being only 3.3km due east of me they were P4 off the side of my 'beam', but after getting over the surprise of finding them on 'channel 5' (programmed with 435MHz) and by the time I had gathered my plugs and leads to record to video, they had migrated to 23/24cm (which I cannot receive, yet!) Hope this may be of use."

Yes, thanks John. All photos are of use and welcomed with open arms. So are letters, and here's one from Jose ON7TP in Liege, Belgium. "Here in Belgium there is still ATV activity but do not forget we have Flemish and Walloon people! A difference in the language is like a barrier. The club ATVB is still alive and our yearly assembly was on October 3 in Heist op den Berg (always the first Saturday of that month). I'll try to write a small report. (I learned English while staying in Germany - it is the truth!)"

Our last letter this time, is from **Mike Sheffield ZL1ABS** in New Zealand; here's what he has to say. "The recent level of activity in Auckland has been very welcome. Five stations in the same weekend working through the ATV repeater qualifies as a 'pile-up', compared to one or two in the winter season past. There are more transmitting stations under construction by Rod ZL1VLZ, Scott ZL1UWQ and newly-licensed Ashley ZL1VOX (neat callsign he got, eh?). The monthly ATV interest group meetings are continuing to be well attended. They are usually on the last Sunday of the month and are very valuable for exchanging ideas, showing off your latest home-brew item, swapping video tapes, getting technical help with equipment and just having a good face-to-face chat.

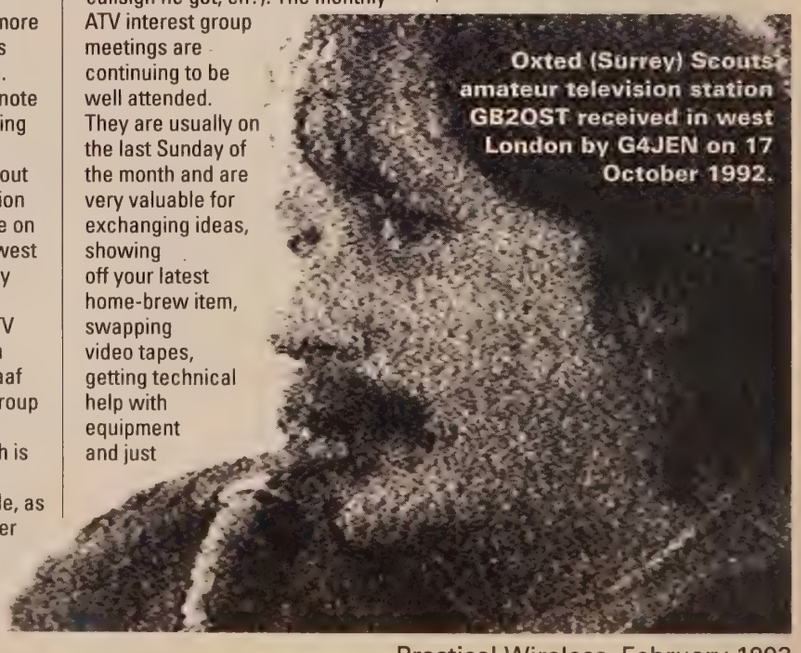
"A construction team of Michael ZL1ABS, Bruce ZL1BLB, Ian ZL1TOQ and Rod ZL1VLZ are building some 'bells and whistles' for the ZL1BQ ATV repeater in Auckland. Michael is building a stepping tones audio generator and modifying a digital speaking clock for repeater use. Bruce is building a two-way electronic A-V switch and a video sync detector to operate it from the repeater's receiver. Ian is building a new channel 39 (615.25MHz) transmitter and driver stage. Rod is building a black and white SSTV receiver for the repeater. Further items will be made when there is someone with time to build them.

"The repeater already has a four-page teletext-style beacon, DTMF receiver, colour bars and two other test cards. Input is 70cm (443.25MHz) and output is 50cm (channel 39 or 615.25MHz). FM sound sub-carrier frequencies are +5.5MHz. The beacon text runs 24-hours a day and there is a regular ATV net on the repeater on Sunday evenings, starting at 8.45pm. The two metres liaison frequency is 147.400MHz simplex.

"This weekend, November 21, I'm off for a 10-day holiday. I have booked a cottage in Palmerston North (midway down the North Island). The local club is having what you would call a rally on the 22nd at a town called Woodville - they're calling the event the 'Woodville Eyeball'. I aim to be there. The small ATV group in Palmerston North are building a repeater, and I hope to see how its going and offer assistance. Later in the week, Wayne ZL1UJK will join me on a day trip to Wellington and the monthly meeting of the Wellington VHF Group. I hope to visit some ATVers in Wellington and see the newly-fitted PM5544 test card operating in the ZL2WA ATV repeater there. It has the same 70cm/50cm input/output as used in Auckland.

That's it for this time; how about seeing your callsign mentioned next time? Start writing now!

Andy G8PTH



Oxted (Surrey) Scouts' amateur television station GB2OST received in west London by G4JEN on 17 October 1992.

Back-Scatter

HF Bands

Reports to
Paul Essery GW3KFE
287 Heol-y-Coleg, Vaynor, Newtown, Powys SY16 1RA

We must start with sad news this time; the death at 64 of Al Slater G3FXB, on November 11. It is understood he had just been out to wind his tower down and on returning indoors he collapsed and died.

Al was one of the greatest - possibly the greatest - UK operators to adorn the 1.8-30MHz spectrum since WWII. Chairman of FOC when he died, he had already held the offices of President and Secretary. There were no significant contests which Al hadn't won.

Notably and unusually, Al seemed to be able to bring home the silverware in either phone or c.w. mode to order. For example: to win the Thomas Trophy in the RSGB's Commonwealth Contest, first in 1973 and then, in total some 18 times.

Apart from his own call, he had taken awards as ZC4ESB and GB8FX. Like most top DXers, Al loved his garden, and he grew enough to feed his whole family. Other interests included jazz music, and of course his family.

Al was such an outgoing person - he had friends everywhere - that many hundreds of people all over the world will have a personal feeling of loss at his passing. Deepest sympathy to Al's wife Maud, and the family.

Conditions

Patchy about sums conditions up. One is told of good moments. When the columnar machinery was cranked up, it is variously awful, up to rather mediocre! In other words, I missed all the purple patches.

Howland Island

Needing KH1? A multi-national team will be heading there, to start activity from Howland Island on January 25, followed by - they hope - a two-day operation from Baker Is. After that, Tarawa, and on to Honolulu, arriving back there on 8 February 1993.

Another report noted in DXNS suggests that an expedition to Palmyra and Kingman Reef is in prospect for February/March 1993. Departing around February 21, reaching Kingman five days later. As the two places are only four to five hours apart by boat, the intention is to swap operators as needed, with both places on the air simultaneously. A minimum of eight to nine days is in prospect.

The EA RTTY Contest runs from 1600Z Saturday February 13, to the same time on Sunday 14th. This is a world-wide contest. Use the appropriate sections of the 3.5-28MHz bands (no WARC of course), and call 'CQ EA Test.' Single-op all-band, single-op single-band, Multi-op all-band and s.w.l. classes.

The EAs will send RST plus 'Prefijo Provincial', the rest of us send RST plus CQ Zone (014 for UK). The Prefijo Provincials are: A, AB, B, BA, BI, BU, C, CA, CC, CE, CO, CR, CS, CU, GC, GE, GR, GU, H, HU, J, L,LE, LO, LU, M, MA, ML, MU, NA, O, OR, P, PM, PO, S, SA, SE, SG, SO, SS, T, TE, TF, TO, V, VA, VI, Z, ZA.

Scoring: on 14/21/28MHz, one point for own continent, two for outside one's own continent. On 3.5/7MHz scoring is three for own continent, six for other continent. Stations in own country count zero QSO points, but are OK for multiplier.

The multiplier is the number of DXCC countries and Spanish Provinces on each band. Final score is total QSO points on all bands times total multiplier on all bands. Separate log sheet for each band, include a summary sheet showing the scoring and other essential information. Mailing deadline is 10 April 1993, to EA1MV, Antonio Alcolado, PO Box 240, 09400 Aranda de Duero (Burgos), Spain.

Prefixes

Via NT2X and *DX News Sheet*, I hear of a proposal to change CIS country prefixes from 1 January 1993, seemingly put up to the ITU without consulting the amateurs concerned, but with the professional services in mind. Under this proposal, 95% of Ukrainian calls would change, and lots of others too.

So, the proposals are listed: 4J, Azerbaijan; 4L Georgia; EK, Armenia; EU or E, Byelorussia; UN, UQ, Kazakh; EX, Kirghiz; ER, Moldova; EY, Tadzhik; EZ, Turkoman; UJ, UMV, EW, Uzbek; UR, UZ, EM-EO, Ukraine; and UA-UI, RA-RI, possibly RZ, Russia. At the time of writing, it is not known whether this will in fact come into force on the proposed date - but be warned!

The 1.8MHz Band

On 1.8MHz, **John G3BDQ** in Hastings comments that G3FXB had written a letter asking if he would like G6CJ's early QSLs, but didn't have time to post it before he died. On the Saturday morning after Al's passing, John heard a W station on 1.8MHz discussing details of the funeral, so the word got out world-wide very quickly.

On 1.8MHz, the G3BDQ c.w. went out to UB5TGJ, F3AT, 5V8ZS (Zante Island), RA3TBL, RB4IC, UA3RG, VE2FU and KI6MS, while sideband made it with LY3BCF, UA2FDJ, 7X2DG and 7X2BK.

Our only other reporter on 1.8MHz is Angie G0HGA, in Stevenage. She has recently come back on the band, and offers YL2GP for a new one the night before she wrote.

The 3.5MHz Band

From Birmingham, **John 2E0ACN** has a Howes rig on the 3.5MHz band at 2W output, and this netted him DH7UAA, PA0XAN, OZ4ST, loads of Gs, GD3FXN, PA0LCE, DJ7SI, GB20PP, ON5AG and ON5UG.

A most interesting listener report comes in from **Geoff Crowley**, in Hafnarfordjur, Iceland. This is at 64.05°N and 21.57°W; Geoff originally hails from Kiwi-land. On 3.5MHz, he notes sideband signals from GM3TCW, EI8H, GI4BGB, OE6MBG and OE6MBG, but he remarks that the indicator of conditions is the Aurora - see Aurora and switch off the h.f. gear!

Angie G0HGA notes that her revised antenna is doing quite well, with K1JD on 60W and W1MK and VY2SS with 10W. During the summer-time trials of this skywire, Angie also worked various W/VE/UL7/UA9 stations; all activity on the key.

The 7MHz Band

A bit more interest was shown on the 7MHz band with Angie G0HGA, who notes DL2ZAE raised with 200mW. Geoff Crowley mentions hearing DL6ET, OE6CLD, EA8BET, DL8TCC, PA3DFU, TF3CW (S9 plus a lot!), CT3FF, G0RTJ, G4LNR, OH3NZW and DL3AK.

Nice to hear from **Don GM3JDR** in Aukengill again, after his major household alterations - he notes just 12(!) dry days between July 1 and his letter, and adds that after the house, came the garage re-build - but as the garage contained the tuner for his half-rhombic that put him off the air for two months!

Anyway, keying on 7MHz since then accounted for CM2MA, CM2QN, CO8RCE/8, ZL4AU, 5B4/G3HFG/P, PY0F/PP1CZ, UJ8JI, JU830C/6, HS1CDX, UL7RDD, ZL1CON, P30WN, RA9LE, PY1BZH, UL7YAD, UL7IDB, VU2LO, VK6LW, J88BX, US50BS, PY4UM, LU6EE, OH1AF/OJ0, VE5ZX, 4J1FM, VK3RP, TF5TP, ZL2ALJ, S57KV, KC4/W6REC, VP5/N4CD, CE0Y/SM0AGD, plus lots of JA and W6-7 by long path around 1400-1500UTC.

Our QRP specialist **Eric G0KRT** 7MHz-only, uses a Lake DTR7 rig, and uses the W3EDP design antenna but with a quarter-wave counterpoise from Worcester Park area. The two-way QRP contacts included three G stations plus EI4DZ; high-power signals coming back to his 1W included DK1EG, Y46TO, F6IGE, F6FLB, FE6DXN, HA8FK, HA1AY, IK5CQI and five other I stations, ON6FT, OZ2SF, RB5ESK, UB6NBJ, UB5CK, UV3AFQ, SP5CS, SP5RDX and YL2UZ. Eric notes that although he tries a CQ or two at each session, they rarely net a response save on the low-power frequency of 7030kHz.

Ted G2HKU and 7MHz c.w. included ZA1J, S59CW and VE2XLT, but much time has been lost this time by problems with the house mains trip operating for no apparent reason, and at the time of writing the search for a culprit was still in progress.

The WARC Bands

On the WARC bands, **Vince 9H1IP** and sideband first; Vince went to 24MHz for UA0FF, OH1AF/OJ0 on Market Reef, 9K2JR, SU1AL/2, HC2RG, Z21ZE, JU830C/6 (Mongolia), 3B8AD, 6W6/WB2P, A71CH, S59AM (Slovenia), A41KW, T49AB (Cuba) and 9A2LH; turning to 18MHz did the trick with CY0NSM (Sable Is), OH1AF/OJ0, V73DO, EV1S, PY0F/PP1CZ, 6W6/WB2P, PY0TSN (Trindade), V47KP, SU1AL/2 and S57MX.

Now to 2E0ACN; I find John has been raking 'em in on 10MHz; 350mW from possibly an 'OXO' managed DL3IAI, OZ5AGN, FG1MGU, 2M0ACI, FD1ODS, HB9NT, DK7SUD, F9OL/P, PA3FWB, DK8WF, OK3CSA, DL1EKU, DL5UBF, DL1GKE, PA3ACX,OK2BFU and FE1JGJ/P. Other than the 2M0 and DL1GKE, all the rest were using high power. For a gripe, John notes the number of phone nets and RTTY stations sitting in the Novice segment. Come on, give the novices a chance, folks!

For GM3JDR 10MHz c.w. served up 9V1YS, 3DA/G3TXF, TA7/KU0J, ZA1W, ZA1D, ZA1J, ZA1C, OH3ES/OH0, 4X4MU, V73DO, UA9OBW, VR2/WX3N, JAs, W6s and W7s. For 18MHz, VU2LO, EU1O, ZA1C, T77C, OH1AF/OJ0, EV1S, RL8PY were dealt with.

Despite all the problems, Ted G2HKU keyed on 10MHz with RY0U,

UH8EA, OY1C, and on 18MHz with US50Os, IT9ZQN, while on 24MHz he recorded VQ9RB, UB5JIB, 3DA/G3SXW and VD3AT.

The s.s.b. from **Don G3NOF** was deployed on 18MHz to raise AK1L (IOTA NA-55), CO7JC, KL7XD, S51AP, VE7IM, Ws, W5ZPA/C6A, VK7KO and VP5/N4GD. Turning to 24MHz, Don located AK1L again, CO1RG, HC2RG, HH2Z, J88AG, OD5/SP1MHV, PJ2MI, PT7BZ, RY0U, SU1AL/2, US1U, V47KP, V51DM, VEs, Z21AV, ZA1H, ZF2QA,/8, ZF2TB, 6Y5PJ and 9Q5PL.

Geoff Crowley in Iceland tried 18MHz for WA2IBX, ZF1UK, ES8ZD, DL7CY, G3ADV, W2FJ, G3LIO; on 24MHz he found VP9MN, OH6NPJ, W9UK, G0MJD/P, K4FDP, DF7JH, W9UK, DL3BUM, OE3JBO, ON5CD, W9MVX, U5WF, ZP5JCY and K3VIY.

The 28MHz Band

On 28MHz, there's a first offering now from a new reporter, **Brian G0OIM** in Wiltshire. The rig is a TS430S to a 2-el cubical quad on 28MHz or a Delta Loop on 14MHz. Brian offers UI8ZAC, 6W6JX, CO2NA, VP8ML, VP2MEG, JU830C in Mongolia, 9K2MU, CN8FR, RY0U, CX4GL, CX9BBG, LU1ATR, SV1BKN, BY5QW, UA0APA, YI1BGD, UW3AE on the key, VK6LG, VR2/WX3N, CU1AC, 9K2HA, WB2KOG, CT3FT, A92T, 5N4KAR and UZ9MYL.

Angie G0HGA in Stevenage, uses a half-sized G5RV on this band, which enabled WB3EPC, NE3P, VP5/WB2YOI, TA3D, TA2BA, Z21SS (a new one), PJ2AM, to trade reports with her and with only 4W she cracked the pile-up on 3X0SNU in five minutes.

On sideband John G3BDQ tackled V21AS, YC8CPU, 7Q7XX, 9K2MU, 6W6/K3IPK,VP5/WB4KSP, ZF2RJ, VK6VTM, A71CH and VG3W (The War Museum, Guelph). On c.w. he reported YN/SM0OIG and CX4GLT.

Just one is noted on 28MHz by Don GM3JDR, to wit 3DA/G3TXF on the key.

LU6JBM, W1FZY, KP4L, 5N0ZKJ, LU5DOF, YN0SM0OIG, 7Q7XX, K4CAD, VD3AT, 3DA/G3TXF, SV0JG - all went in the c.w. log of Ted G2HKU, plus one with C9RJJ using just 4W.

Bringing up the rear on this band is G3NOF; Don's sideband reached HZ1AB, P40J, PJ9M, PT7FX, PU0F, TL8NG, TU2CI, V3IDX, VP9AD, WA7EGA, ZF2JI, ZD8Z, ZS5HAM, 5K6C, 6V6U and 9ER1TA.

The 21MHz Band

On the 21MHz band, John 2E0ACN writes to note his collection: KA9UHW, UA3DTT, SM5DUT, UA4QK, W8RSW, KA8PCJ, LZ3KAB, 4N5FAD and UA4CNQ, all with a couple of watts and a B40 receiver to a long-wire.

For Don G3NOF, the sideband produced AH9B/VO2, C6AFT, JE4VVM, JF4ETK, K8SCH/OCK (IOTA NA-67), NP2E, OA4ANR, P40A, PJ1B, R00F, S51GE, S57EK, VD7ON (=VE), VE7KD, VE7ZZZ, VP2EC, VP50, XX9AW, 8P9Z, 9A1A and 9K2JC.

It was c.w. as usual for Don GM3JDR hereabouts and VP5P, ZA1Z, UZ0LWC and EH4MC.

On the other hand, sideband all the time for John G3BDQ on 21MHz, to give him FH8CB, DU1GWQ, DU3RCM, YC6KEH, 9V1WW, 4O4XR (Banjaluka, Serbia), 9K2JC, CU3/N0FHL and TA1A.

To wind up here, Angie G0HGA mentions an R/AA7LN, which I suspect is a typing slip for RA/AA7LN, plus 4J1FM.

The 14MHz Band

Nothing, alas, since the space has run out!

New Look

Our new look arrives in March, send it all in next time as usual, by the middle of the month, to the address above. Meantime, 73, and GL.

Back-Scatter

VHF Up

Reports to
David Butler G4ASR
Yew Tree Cottage
Lower Maescoed, Herefordshire HR2 0HP

Solar Data for November 1992

During the period November 1-9 there was a large increase in geomagnetic activity due mainly to a massive X9 flare (the largest for some years) which occurred on November 2 at 0245UTC. This pushed the daily A index on the 2nd to an estimated level of 23 units and during the remainder of the week many subsequent proton events were recorded.

On November 9, there was a small magnetic storm, but very little in the way of auroral activity was observed during this period, with only minor openings occurring on November 1 and 4th. Another auroral opening was detected on November 23, this being preceded on November 22 by three small M-type flares.

Auroral Openings

As I've already mentioned, auroral openings during November were very few and far between. Only weak events were detected in central England on November 1 at 2230UTC, November 4 at 2340UTC and November 23 at 2045UTC.

Very little in the way of 'real' signals were reported and I guess if it wasn't for beacons such as GB3RMK (50.060MHz), GB3NGI (50.062MHz), GB3LER (50.064MHz/144.965MHz) and SK4MPI (144.960MHz) then most of these brief openings would have been missed.

Auroral Calendars

In last months column, I mentioned the need to keep your 27-day auroral calendars up-to-date, but I didn't actually describe how or why they work. Very simply, you only have to remember two facts. One, certain actions on the sun causes auroral activity on earth and two, the sun is a gaseous body and takes approximately 27 days to rotate.

The actions on the sun (the actual mechanism need not be discussed at this stage) can be likened to that of a spray from a rotating garden hose. The sun squirts material out in a broad 'spray' and the earth can be effected for several days, every 27 days, sometimes for several rotations.

So, if you make a calendar like the one shown in **Fig. 1** and record every auroral event you detect or hear about, it is then possible to predict when repeat events might occur and take appropriate steps. As I'm writing this on December 1, it's not possible to let you know if an aurora occurred on December 20, but I'll certainly inform you next month if one did!

Tropo Conditions

There were a number of days during November when tropo conditions were excellent on all v.h.f. bands through to microwaves. Notably, the period November 5-8 and 23rd, allowed many contacts to be made with stations in DL, EA, F, HB9, OE and OK.

Ela Martyr G6HKM (JO01) worked a new square on October 8, when she contacted SP2OFW (JO93) on the 144MHz band, but thought that the opening was favouring stations further to the west of her QTH, although a contact was also made with SP6MLK/P on the 430MHz band. However, an opening on November 5-6 was very good and s.s.b. contacts on the 144MHz band were made with a number of stations, including HB9RCJ (JN37), OE5VHL (JN68), who was also worked on the 430MHz band, OK1UBR (JN69), OK1VEI (JO70) and OK1VMS/P (JO60).

Unfortunately, the good tropo conditions did not coincide with many of the recent 1296MHz cumulatives contests, only four stations being worked on October 21. A little better on November 6, when 17 QSOs were made, including GD4GNH (IO74).

Ralph Sachs G2CZS (JO01) mentions that the opening to eastern Europe on November 6 provided some light relief from the generally poor conditions. His s.s.b. contacts on the 144MHz band included OK1FTA/P (JN79), OK1FZA/P (JO60), OK1VMS/P (JO60), OK1VYF (JN69) and other stations in DL and F.

Terry Chaplin G1UGH (JO02) also caught the good conditions on November 5-6, the best of the bunch being EI2GK (IO63), EI3CI (IO63), LX1CT (JN29) and OK1MAC (JN79), all being worked on s.s.b.

Ian Cornes G4OUT (IO92) was hoping that the good tropo would continue into the weekend of November 7-8, to coincide with the IARU Region One 24-hour c.w. contest. As is normal in these cases, the conditions started to drift away before the start, but nevertheless a number of c.w. contest QSOs were made, including 13 x DL, 9 x F, 6 x ON and 4 x PA.

Up in the north of England, **Rik Royall G8ESB** (IO94) didn't find much to report, although he could hear others working the DX. He did however mention working F1CYB (JN17) on November 5 on the 144MHz band, and EI2GK (IO63) for the first EI of 1992 on the 430MHz band on November 8.

The 144MHz band was in good shape on November 22, with **Andy Cook G4PIQ** (JO02) reporting an opening to Spain with EA2ADJ (IN93) pounding in on s.s.b. and **Richard Gardner G4WKN** (IO92) catching FC1DUH (JN13), FC1SZL (JN03) and F6FZS (IN93). **John Quarmby G3XDY** (JO02) worked F1ER (JN03) on the 144MHz band and then moved him up to the 1296MHz band to work him on s.s.b. peaking 51.

Dave Akrill G0DJA (IO93) refutes any recent comments made about lack of c.w. activity on the u.h.f. bands, and he reports that in his area there is regular activity on a daily basis. Mind you, it does get a little monotonous listening to the Emley Moor beacon GB3MLY (432.910MHz) all the time!

Back-Scatter

On the 144MHz band, he runs either 1W QRP or the full-blown 25W into a 9-element Yagi, this is sufficient to work around the country when using c.w. Recent contacts have included GI4OWA (IO64) and a two-way QRP contact with G0RAX/M, presumably static but you never can tell!

Moonbounce

On to moonbounce now. **David Law G0LBK** reports that his 144MHz e.m.e. system, consisting of four 9-element Yagis and a 4CX1000 amplifier, is working very well, and that he can quite often obtain echoes with 250W.

The system seems to be properly optimised, because on August 2 he made a random s.s.b. contact with SM5FRH, a mode that is not normally used. During the ARRL e.m.e. contest, held in October/November, a total of 50 c.w. contacts were made with stations located in DL, EA, F, G, GM, I, JA, LA, LZ, OE, OH, OK, ON, OZ, SM, UA2, VE and W.

David mentions that he hopes to be active during 1993 on 1296MHz e.m.e., as he is planning a joint venture with **Jon Naylor G4KLX**. They expect to use a 4m dish and a 250W amplifier.

Single Yagi Stations

Conditions during the second leg of the ARRL e.m.e. contest, held on November 14-15, appeared to be quite good. The conditions allowed a number of single Yagi stations to make QSOs via the moon with some of the bigger systems.

Geoff Beresford G7KQW, using a 144MHz 15-element CueDee Yagi, heard SM5FRH so well that he was able to relay his signals over the telephone to G0LBK. Another station, G4KLX, heard SM5FRH with a 4-element Yagi and DL9KR on the 430MHz band with only a 9-element Yagi!

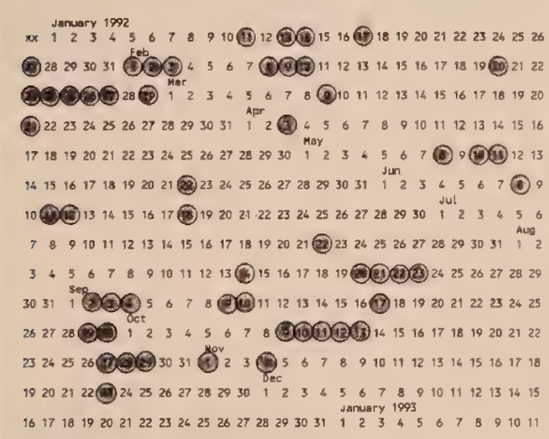


Fig. 1: An auroral calendar.

Colin Morris G0CUZ, using only a 5-element Yagi, managed to work W5UN on the 144MHz band, as did **Bob Harrison G4UJS**, who was using an FT726R into a QQV06-40A amplifier and a 9-element Yagi fed with 45m of UR67 feeder! The Texas station first sent QRZ and then received full callsigns on the next over. Excellent stuff!

At my QTH, the banana-shaped (it's been very windy lately) 18-element Cushcraft Boomer Yagi enabled me to work SM5FRH, KB8RQ and W5UN, and to hear DL8DAT, I1KTC, IK3MAC (he got my callsign as G4ASN!), UZ2FWA and WA1JXN/7, with all stations being heard when the moon was between 10-20° above the horizon.

Ron Stone GW3YDX is now active on e.m.e. and getting the results one would expect with 280W and 4 x 17-element F9FT Yagis. So far, 21 separate stations have been worked, but nearly 100 have been heard. Ron mentions that he knows the answer and he's working on it!

Four Yagis

John Regnault G4SWX did very well during the contest with his array of four 16-element LBX Yagis and an 8877 amplifier. A total of 63 contacts were made on the 144MHz band, with stations in 27 countries and five continents.

Some of the more interesting callsigns included JL1ZCG, JA4BLC, KH6FOO, UA4NX, RA6HHT, UA9FAD, VK3AMZ and ZL1BVU. Not bad for a line-of-sight v.h.f. band!

Massive Dish

A group of operators, including Dennis VE3ASO, Ray W2RS and Mike W9IP, had made plans to use a massive 50m radio astronomy dish. The dish is owned by York University, Toronto, but because of very bad weather and a power outage, they were unable to be operational.

Using the callsign **VE3ONT**, it was the intention to be active on the 430MHz band with a 8938 p.a. coupled into a short helical feed to produce circular polarisation. With a system of this size, it would have been easy to work single-Yagi stations running less than 100W.

It was reported by W9IP that the same group of operators are planning to use the dish on the 430MHz band during Spring 1993, possibly coinciding with the REF e.m.e. contest. Later in the year they are also planning a 3-band e.m.e. effort on the 144MHz, 432MHz and 1296MHz bands. That should certainly burn a hole in the moon!

The 50MHz Band

Time to look at the 50MHz band. In November 1991, many UK stations reported contacts with Australasia (VK) on November 4 and 20th, the continent of Africa (CN, TR, TU, V5, ZS, ZS9, 9L) on November 1, 2, 3, 4, 10 and 17th, with South America (CX, HC, HC8, LU, PJ4, PY) on November 2, 3, 4, 7, 16, 17 and 18th and with the North American continent (KP2, KP4, PJ7, VE, W, 9Y4) on November 2, 6, 13, 14, 17, 18, 21 and 23rd. (And it was even better in 1989 and 1990 as the QSL card in **Fig. 2** shows).

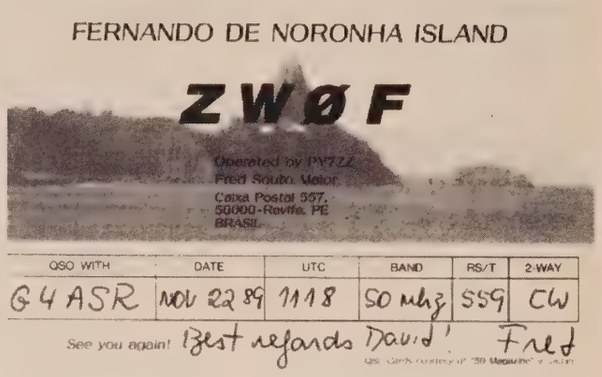

FERNANDO DE NORONHA ISLAND
ZWØF
Operated by PY7ZZ
Fred Souto Vieira
Caixa Postal 567,
50000-Recife, PE
BRASIL
QSO WITH | DATE | UTC | BAND | RS/T | 2-WAY
G4ASR | NOV 22 89 | 1118 | 50 mhz | 559 | CW
See you again! Best regards David! Fred

Fig. 2: There was good DX on 50Mhz in 1989/90.

By contrast, only one DX station outside of Europe, CN8ST, was reported during November 1992, and even that was no big deal, as Morocco is within Sp-E distance of the UK and is regularly worked via that mode in the summer. On the other hand, if you don't use c.w., you may not have heard him at all.

Now here's a good idea! Instead of listening to white noise on 50MHz, why don't you spend the time learning c.w., then next time you'll know who it is rattling off those dots and dashes! And then you'll also start working the real DX in auroral openings and on meteor scatter and on e.m.e. etc., etc. Meanwhile, off the soap box and back to the reports.

Neil Carr G0JHC (IO83) mentions that he has only heard one signal outside of Europe since July and that was ZS6AXT on October 26, peaking 559 on c.w. between 1310-1353UTC. None of the PY/LU/ZP/7Q openings via t.e.p./Sp-E that are normally heard during October-November in recent years have made their way up to the north-west of England.

At least there was some Sp-E during October, allowing a handful of contacts to be made with stations in EA, F and I, but even so, conditions have been so bad, that Neil resorted to meteor scatter to work a new square HB9BQU (JN37) on October 18 at 0200UTC. Desperate stuff!

It's a very similar story at my QTH (IO81), with the only real DX getting in the log being ZS9A (JG77) at 1312UTC on October 30. Between 1305-1333UTC, I also heard the V51VHF beacon (50.017MHz), but nothing else in the way of amateur signals. Looking back in my log book, the last stations worked outside of Europe were EH9MH (country 111) on July 26, TA5ZA on June 27 and many VE and W in the big opening on June 22, all of these openings being via Sp-E.

Ken Grover G3KIP wrote in some time ago (sorry for the delay OM!) bemoaning about the lack of activity on the band. On a number of occasions when the beacon GB3NHQ is S-points stronger than normal (tropo) or when TV signals are heard (Sp-E), he will put out a CQ, but very few stations are raised. Where is everybody? I can answer this quite simply. Like it or not, most operators only want to work DX on the band and are not prepared to work local stations. Of course, columns such as this don't help in this respect, as they tend only to report about DX contacts or leading edge modes, rather than the mundane, less news-worthy, run-of-the-mill, inter-G contacts.

The problem is that no one compels you to work short distances on 50MHz and generally most operators have degenerated into the "I must only work DX and take no more than 10 seconds" mode, rather than discovering some of the band's other potentials. And again, to be truthful, I suspect many operators enjoy that 'anti-social' way of operating.

Ramon EH3AQJ (JN11BI) is using 30W into a 5-element Yagi and is very interested in trying meteor scatter tests on the band, especially with stations over 2000km away. He was active during the Geminids shower, December 12-13, using high speed c.w. on 50.169MHz.

Over in Eire, **EH9IB** has recently upped his power to 25W (previously 3W) following a donation by G3KOX of an amplifier which was shipped to Melilla by the UK Six Metre Group (UKSMG).

The Baghdad club station **YI1BGD** has received a permit to operate on the band and is looking for a 50MHz transceiver.

If anyone is prepared to donate a rig, preferably a mono-band set, please contact **Nick Waite G3KOX** (Tel: (0438) 715713) who can arrange carriage to Iraq.

The beacon **OD5SIX** arrived in the Lebanon (via the UKSMG) on November 24 and is now operational on 50.078MHz sending "OD5SIX KM74". It runs 8W output into a vertical antenna.

Back-Scatter

The 430MHz Band

As you should know, (and for those that don't, refer to the Amateur Radio Licence Booklet BR68) the status of the Amateur Service and Amateur Satellite Service in the 430-440MHz band is on a Secondary basis. Basically, this means that the Amateur Service, i.e. you, must not cause undue interference to stations of the Primary user or other permitted services.

It should be noted therefore that the Primary user has allocated two spot frequencies, 435.725MHz and 435.750MHz, for use by units of the Royal Air Force Volunteer Reserve and that this RAF traffic has priority over amateur usage. Fortunately, the majority of UK amateurs will not be affected by this, but if you run Fast Scan Television (FSTV) and you live close to an airfield, it may be best to listen first before transmitting.

The Microwave Bands

Because of the increasing popularity of 10GHz microwave bands transverters, such as the G3WDG design described in the June edition of *PW*, some really long distance narrow-band contacts are now taking place. But before I describe some results, I better clarify what I mean by narrow-band.

Very simply, this relates to the transmission mode used, and by convention, c.w. and s.s.b. are described as narrow- band modes, and f.m.-based transmissions (which can include TV) are described as wide-band. It is also taken to mean that narrow-band equipment uses very stable crystal or v.f.o. control, and wide-band equipment uses free-running oscillators.

The importance of this statement is that with a very stable (n.b.) transmission and a similarly stable receiver, the selectivity (i.e. bandwidth) can be very much reduced, therefore tremendously increasing the system gain.

The Results

Meanwhile, back to some of the results. One such event worthy of mention took place last year during the evening of July 6, when **Morgan Larsson SM6ESG** (JO67) worked a total of nine UK stations on the 10GHz band, everyone incidentally operating from their home QTH, and not from an elevated portable site. The contacts were made with G4BYV (JO02) at 868km, G3LQR (JO02) at 883km, G4FUF (JO01) at 976km, G3WDG (IO92) at 981km, G8APZ (JO01) at 985km, G3ZFP (IO91) at 1013km, G3BNL (IO92) and G0ERK (IO92) both at 1029km and G4FCD (IO91) at an amazing 1040km.

Charlie Suckling G3WDG runs 3W output in the shack into a 60cm offset fed dish at 10m above ground. During the same evening as working SM6ESG, he also contacted OZ1HDA (JO47) and SM6HYG (JO58) at a distance of 1008km. On September 16, he worked HB9AMH/P and HB9MIN/P, both in JN37 on 10GHz s.s.b. at 59 bothways, these contacts bringing his locator squares total for the band up to 21.

The system at the station of **Richard Girling G4FCD** consists entirely of G3WDG modules and runs 200mW into a 60cm dish. Richard comments that no problems were encountered in building or alignment and he congratulates G3WDG for a very repeatable design. Interestingly, Richard had only been QRV on the band for a few weeks before becoming the UK 10GHz DX record holder.

Details of the G3WDG 10GHz module kits can be obtained from **Petra Suckling G4KGC**, 314A Newton Road, Rushden, Northamptonshire NN10 0SY, (please enclose an s.a.e.). Tel: (0933) 411466.

John Fell G0API, located in Wimborne, Dorset, is looking for s.s.b. and c.w. schedules on the 1.3GHz and 10GHz bands during the evenings and weekends. You can contact John by telephoning him in the evenings on (0202) 691649.

Another station looking for 10GHz schedules is **Colin Douglas G8LDJ** (JO01). He is QRV on wide-band f.m. and located fairly close to the east coast of the UK, so he may have a good take-off into F, ON and PA. You can contact Colin via his packet radio mailbox @ GB7ICE.

Novice News

It's nice to receive information from our new novice licensees and I'm sorry I couldn't print these letters earlier, but the *PW* 60th anniversary editions took precedence. **Keven Matthews 2E1AIU** (JO01) runs an FT790R on the 430MHz band with 1W of r.f. into a discone antenna.

During a tropo lift in May, he managed to work PA3FSD, PA3GBW and PB0AKQ. All of these contacts were made on f.m. simplex on either 433.425 or 433.450MHz, and during the same evening Keven also heard stations from GJ and GM on a repeater. He is also QRV on the 50MHz band, with a Tokyo transceiver and regularly monitors 51.300MHz for s.s.b. contacts, but comments that it is very quiet up there.

Darrell Moody G0HVQ worked his first novice, **2E1AFP** (IO92), on 51.260MHz s.s.b. during a recent aurora. He encourages everyone to call around this frequency to create a little bit more activity for the novice licensees.

Of course, being a novice on the 50MHz band does create unique problems insofar that a number of countries do not have allocations in the 51MHz region. The only way therefore to work a novice in these circumstances is to operate split, that is with two v.f.o.s, one set to your (lower) transmit frequency and the other set to the (higher) receive frequency.

For the novice, this is obviously reversed. At the station of ON4ANT, this technique was used to work **2E0AAX**, by transmitting on 50.145MHz and receiving on 51.260MHz.

Caz Pickles 2E1AMP (IO83) is active on packet radio on 433.675MHz and would be pleased to receive messages at her local mailbox @ GB7LIV. Another novice new to amateur radio and packet is **Richard 2E1BED** (IO93). He uses an Amiga computer and t.n.c. to access the network on the 430MHz band.

Are there any more novices out there? Please drop me a line and tell me what contacts you have made on the v.h.f. bands.

New DXCC Countries

In last month's column, I gave details of the ARRL DX Advisory Committee (DXAC) recommendation to create new DXCC countries from the former Yugoslavia. The recommendations were passed to the ARRL Awards Committee, who voted unanimously to accept three recommendations from the DXAC. The following countries are now added to the DXCC list: The Republic of Croatia - 9A (formerly YU2), The Republic of Slovenia - S5 (was YU3) and The Republic of Bosnia-Hercegovina - YU4, 4N4.

Contacts with Croatia and Slovenia can be counted from 26 May 1991 and those with Bosnia-Hercegovina from 15 October 1991. A DXAC recommendation to add The Republic of Macedonia - YU5, 4N5 to the DXCC list was not accepted, and remains under study until a later date. The remaining entity of Yugoslavia, (YU1, YU6, YU7 and YU8) continues on the DXCC list.

Contests

A series of 70MHz cumulative contests have been arranged to take place on January 24 and 31st, February 21 and 28th and March 14, each session running between 1000-1200UTC. In addition to exchanging callsigns, report and serial number, stations must also give locator and QTH information.

An RSGB 144MHz c.w. contest will be held on Sunday January 17, between 1000-1600UTC. There are sections for the single operator fixed station, all others and listeners and competing stations exchange callsigns, report, serial number, locator and county.

A 430MHz fixed station contest will take place on Sunday February 7, between 0900-1500UTC. This contest is not only open to individuals (who must be RSGB members) but is also open to teams of operators belonging to an RSGB affiliated society (AFS) who need not necessarily be RSGB members themselves. The contest exchange consists of callsigns, report, serial number and locator.

The Nordic activity contests (mentioned last month) will be held between 1800-2200UTC on January 19 (Microwaves), January 26 (50MHz), February 2 (144MHz) and February 9 (430MHz).

To stimulate DX activity on the 144MHz band, the German VHF-DX Group, has organised an activity contest lasting one calendar year, commencing 1 January 1993. For every contact over 500km, one point may be claimed. Repeat contacts with DX stations are not allowed.

The total score is the number of different DX contacts multiplied by the number of locator squares worked. You may count any locator squares worked in the year irrespective of distance. A full set of rules, including a locator map, can be obtained by sending me an s.a.e.

Tables

Final entries for the yearly tables must be received by me by the end of January. They will appear in the April issue of *PW*, on sale 11 March 1993.

Deadlines

As usual, please send your letters to reach me by the end of the month at the very latest, as I normally write up the column around this time. Don't forget that I can also receive messages via packet radio at my mailbox GB7TCM or at my DX cluster GB7DXC.

Photographs of your shack, antennas or any v.h.f. activity are especially welcome. Other pictorial items, such as QSL cards, awards, certificates, etc., are also required. They will all be returned to you.

New Look Specialist Columns

This issue of *PW* sees the last edition of 'Backscatter' as a section in the magazine. As from the March issue, all the specialised interest articles formerly presented in 'Backscatter' will be stand-alone features in their own right. The new columns will be easier to read, with larger print to match the rest of the magazine.

Paul Essery GW3KFE's new-look column 'On The HF Bands' will have one page every month, while David Butler G4ASR's 'VHF Up' column will have two pages in every issue. Last, but certainly not least, comes the 'Broadcast Round-Up' page produced by Peter Shore. Peter will continue to provide interesting comment, news and reviews on the short wave broadcasting scene.

The editorial team will be pleased to hear your comments and suggestions on the new-look specialist columns. You can write to us at our new editorial address at: *Practical Wireless*, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

Back-Scatter

Broadcast Round-up

Reports to Peter Shore via the PW Editorial Office

In the last editions of *PW* I have been reporting on the Dutch government's deliberations on the future role of Radio Netherlands, the Dutch international radio service. Whilst there is the suggestion that there needs to be new strategy, developments in the station's broadcasting took a leap into the New World Order with the announcement in late November that transmissions to Asia would now be beamed on transmitters in Russia and other parts of the former Soviet Union.

The transmissions started on New Year's Day, and the schedule to March 6 appears in European News later in this column.

And Radio Netherlands is now talking with other European broadcasters about the possibility of starting joint programme streams in English, French and German beamed to European listeners. BBC World Service, Radio France International and Deutsche Welle have met in recent weeks to talk about establishing new programme services and on how to reach areas of the world, such as the Pacific or North America, where international services are not widely listened to. Perhaps an EC station will emerge in the not too distant future.

As we went to press, reports came in that Azerbaijani Radio in Baku would start English language transmissions to Europe. No details have emerged yet, but if anyone traces the transmission, please drop this column a line.

The former Soviet satellite countries in eastern Europe are starting to enter the west's broadcasting world. Poland has announced that by the year 2005 all v.h.f.-f.m. radio broadcasts are to be in Band II, 87.5 to 108MHz, replacing the Band I allocation of 66 to 74MHz. That is the band currently used by a majority of broadcasters in the former Soviet empire. It is expected that all European countries will be harmonised before too long: what a wonderful opportunity for radio manufacturers and retailers!

If you would like to know what stations operate in the UK, one DX club's publication might help. *Radio Stations in the United Kingdom* is published by the British DX Club and the 11th edition was recently released. It carries details for all British medium wave and f.m. stations with listings by frequency order together with transmitter location and power. Contact addresses and telephone numbers are listed. There is also information on special event stations, "unofficial radio" and future plans of BBC and independent radio. The book is available for £2.00, US$4.00 or five international reply coupons from **The British DX Club, 54 Birkhall Road, London SE6 1TE. (ISBN 09514723 3 X).**

An attractive sticker available from Radio Australia.

European Stations

All times GMT(=UTC)

In the former Yugoslavia, Radio Bosnia-Hercegovina, Studio Sarajevo, is now operating in the 49m band on 6.220MHz, replacing the old channel of 7.238 and 7.137MHz. The station operates on upper sideband.

Croatian Radio, Studio Zagreb is heard 24-hours a day on 6.125MHz, with 5.025 on the air during the evening and night. Daytime channels include 9.83 and 13.83MHz.

The YLE Radio Finland service is to be expanded, despite a reduction in the overall budget for Yleisradio. There will be an increase in output during 1993.

The Radio Budapest's English services are now beamed once a day to the Americas at 0300 on 11.91, 9.835 and 6.11MHz and to Europe at 2200 on the same frequencies. Both transmissions are one hour in length.

Radio Netherlands' relays via CIS sites are heard:

0030-0325 to South Asia in English via Chita on 11.675MHz

0800-0925 to Cambodia in Dutch via Chita on 15.21MHz

0930-1125 in English to East and South East Asia via Irkutsk on 9.81MHz

0930-1125 in English to the Far East and East Asia via Petropavlovsk on 7.26MHz

1130-1325 in Indonesian via Irkutsk on 9.81 and via Tashkent on 17.655MHz

1330-1425 in Dutch to East and South East Asia via Irkutsk on 9.81MHz

1330-1425 in Dutch to the Far East and East Asia via Petropavlovsk on 7.26MHz

1430-1525 in Indonesian via Tashkent on 9.855MHz

2330-0025 in Dutch to South East Asia via Tashkent on 9.855MHz

The international service of Polish Radio has started transmissions to Czechoslovakia. A Czech language service started in November and Slovak will begin during early 1993. Czech can be heard daily at 1630 on 6.095MHz for 30 minutes. English to Europe is heard:

1300-1355 on 11.815, 9.525, 7.145 and 6.135MHz

1600-1655 on 11.84, 9.525 and 7.285MHz

1800-1855 on 9.525 and 7.27MHz

1930-2025 on 9.525 and 7.27MHz

2030-2125 on 9.525, 7.27, 7.145, 6.135 and 1.503MHz

In Sri Lanka, **Asantha R. Cooray** has been receiving Swiss Radio International's English transmission at 1300 on 13.350, 15.505, 17/67 and 21.82 and via Beijing on 7.48 and 11.69MHz.

The BBC World Service is now using Albanian facilities on 1.458MHz for Serbian and Croatian transmissions between 2200 and 2230. It is also making use of Nepalese transmitters in Surkhet and Katmandu on 576 and 792kHz for Hindi, Urdu and English services. If you are holidaying in Finland, perhaps they would be a good catch!

African And Middle Eastern Stations

The Voice of Ethiopia has English at 1500-1600 on 7.165 and 9.56MHz.

The Voice of the Islamic Republic of Iran has English for 60 minutes at 1930 on 15.26 and 9.022MHz.

The Rwandan rebel station, Radio Ruhubaru, noted on 6.340MHz variable in Sri Lanka with an irregular schedule between 1600 and 2000 and 0130-0500.

Asian And Pacific Stations

Radio Australia has introduced a Cambodian language service on the air daily. It can be heard at 0530-0600 on 17.88 and 17.67MHz and at 1230-1300 on 13.755, 9.77 and 7.15MHz.

Roy Merrall reports that the English Service has been using 25.75MHz to the North Pacific, heard occasionally with SIO 142 after a very weak sign-on at 0759. This channel closes at 0857 with SIO 252. Asantha Cooray has heard advice to listeners in Europe to tune in:

0700-0900 on 21.59, 0800-1300 on 21.725, 1430-1900 on 13.755 and 9.51, 1900-2100 on 7.26 and 6.02 and 0730-0830 on 15.24MHz.

Asantha Cooray has noted Radio Bhutan at 1415-1500 on 5.025MHz.

Also noted are Indonesian stations: RRI Palangkaraya on 3.325 2200-2300 with English teaching programme; RRI Gorontalo on 3.265 between 2100 and 0015; RRI Banjarmasin on 3.2499MHz at 2130 to 2400; RRI Medan in English on 4.765 at 2200-2400 with English additionally on Saturday and Sunday 2300-2330.

Radio New Zealand International is heard reasonably clearly on 9.70MHz up to close at around 11.59-1205, but suffers strong QRM from Radio Liberty on 9.705MHz.

Radio Thailand's external service in English noted in Colombo at 2300-0430, 0500-0600 and 1130-1230 on 4.83, 9.655 and 11.905MHz.

North, Central And South American Stations

I was not too certain where to place this logging from Asantha in Colombo: it's of Radio St Helena in the South Atlantic which has English on 11.0925MHz in u.s.b. daily at 2000-2100 and 2200-2300. The station requests FAXed reception reports to 010 290 4542 and in addition there is a programme phone-in line on 010 290 4654.

Meanwhile Radio Bras in Brazil beams to Europe at 1800 to 2000 on 15.265MHz, a service also noted by Asantha.

A US religious broadcaster, the quaintly named Gene Scott's University Network based in Los Angeles, is hiring time on a Russian transmitter. The site at Novosibirsk operates on 21.845MHz between 0400 and 0800. The plan is to extend this to 24-hours a day during 1993. The University Network is also aired via WWCR in Nashville on 5.935MHz. The station's address is PO Box 1, Los Angeles, CA 90053, USA.

The World Service of the Christian Science Monitor noted at 0000-0200 using three sites: WSHB on 13.76, WCSN on 9.85 and KHBI on 17.75 and at 0200 until 0400 on two with WSHB still on 13.76 and WCSN on 9.35MHz.

A small reminder about Britain's biggest Amateur Radio event.

LONDON
AMATEUR RADIO & COMPUTER SHOW

Saturday March 13th & Sunday March 14th

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For further details contact The Secretary, 126 Mount Pleasant Lane, Bricket Wood, Herts, AL2 3XD.

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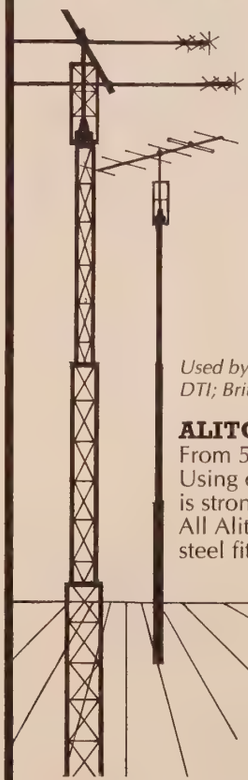

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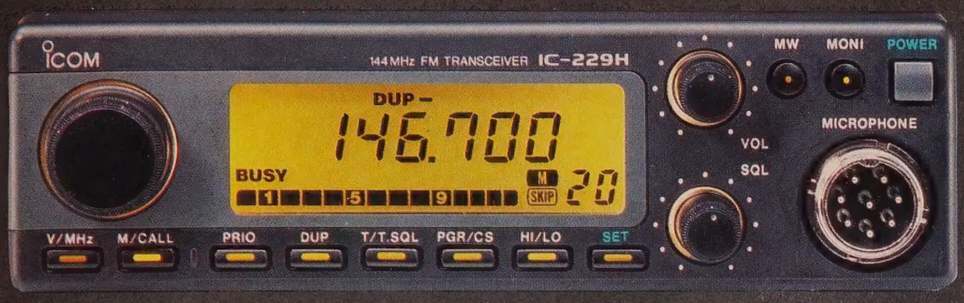


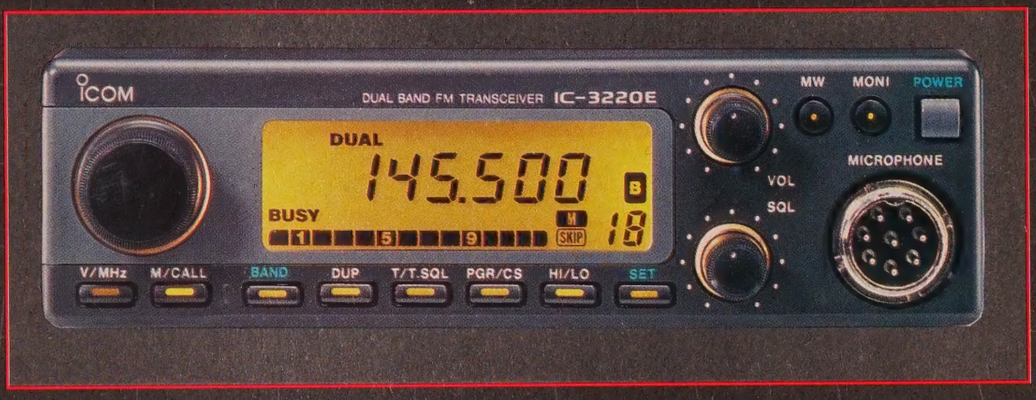
IC-229E/H
144MHz FM transceiver
IC-449E
430MHz FM transceiver

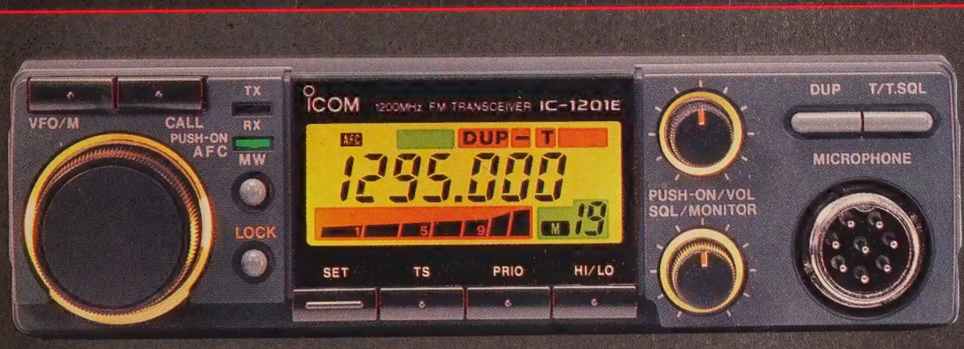
- Ultra-compact body.
- One-touch access functions.
- 20 memory channels.
- Illuminated switches and controls for night driving.
- 140(w)x40(H)x105(D) mm.

Photograph shows U.S.A. version

IC-3220E/H
144/430MHz Dual band FM transceiver.

- Simple dual band operation.
- Receives 2 band signals simultaneously.
- Full duplex QSO.
- Optional pager, code squelch, packet beep & tone squelch.
- 140(W)x40(H)x195(D)mm.





IC-1201E
1200MHz FM transceiver

- High sensitivity receiver.
- Stable 10W output power.
- Convenient AFC, RIT and VXO functions.
- 20 memory channels.
- Priority watch.
- Programmable call channel.
- 140(w)x40(H)x200(D) mm.

IC-901
144/430MHz dual band FM transceiver

- Detachable remote controller.
- 6 band capability: 28, 50, 144, 430 and 1200MHz.
- Simultaneous dual band reception.
- Optional wideband receiving unit.
- 150(w)x50(H)x191(D) mm.

For further information about ICOM products and your nearest authorised dealer please contact:
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Telephone: 0227 741741 (24hr). Facsimile: 0227 741742

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